IMKH California

# Integrated Math 1

## Teacher Resource Copy Masters

## UNITS 1-3



Book 1

Certified by Illustrative Mathematics®

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**INTEGRATED MATH 1**

UNITS

# 1-9

## Teacher Resource Copy Masters

BLACKLINE MASTERS LIST

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Unit IntegratedMath1.1 | Blank Reference Chart | 1 | yes | no | no | no | no | no |
| Unit IntegratedMath1.1 | Math 1 Geometry Reference Chart - Full | 1 | no | no | yes | no | yes | no |
| Unit IntegratedMath1.1 | Math 1 Geometry Reference Chart - Scaffolded (SF) | 1 | yes | no | yes | no | yes | no |
| Unit IntegratedMath1.1 | Math 1 Geometry Reference Chart - Scaffolded (TF) | 1 | no | no | no | no | yes | no |
| Unit IntegratedMath1.2 | Blank Reference Chart | 1 | yes | no | no | no | no | no |
| Unit IntegratedMath1.2 | Math 1 Geometry Reference Chart - Full | 1 | no | no | yes | no | yes | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Unit IntegratedMath1.2 | Math 1 Geometry Reference Chart - Scaffolded (SF) | 1 | yes | no | yes | no | yes | no |
| Unit IntegratedMath1.2 | Math 1 Geometry Reference Chart - Scaffolded (TF) | 1 | no | no | no | no | yes | no |
| Unit IntegratedMath1.5 | Blank Reference Chart | 1 | yes | no | no | no | no | no |
| Unit IntegratedMath1.5 | Math 1 Geometry Reference Chart - Full | 1 | no | no | yes | no | yes | no |
| Unit IntegratedMath1.5 | Math 1 Geometry Reference Chart - Scaffolded (SF) | 1 | yes | no | yes | no | yes | no |
| Unit IntegratedMath1.5 | Math 1 Geometry Reference Chart - Scaffolded (TF) | 1 | no | no | no | no | yes | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Activity IntegratedMath1.1.2.1 | 6–12 Blank Math Community Chart | 30 | no | no | no | no | no | no |
| Activity IntegratedMath1.1.9.4 | Another Layer Handout | 1 | yes | no | no | no | no | no |
| Activity IntegratedMath1.1.10.2 | Blank Reference Chart | 1 | yes | no | no | no | no | no |
| Activity IntegratedMath1.1.11.2 | What's the Point Reflections Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.1.14.2 | What's the Point Rotations Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.1.15.2 | Self Reflection Handout | 8 | yes | yes | no | no | no | no |
| Activity IntegratedMath1.1.17.2 | How Did This Get There Cards | 2 | no | yes | no | yes | no | no |
| Activity IntegratedMath1.1.19.2 | Duplicate a Design Handout | 1 | no | no | no | no | no | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Activity IntegratedMath1.2.3.2 | Invisible Triangles Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.2.3.3 | Triangle Transformation Proof Template Handout | 1 | no | no | no | no | no | no |
| Activity IntegratedMath1.2.4.2 | Too Much Information Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.2.5.3 | Triangle Transformation Proof Template Handout | 1 | no | no | no | no | no | no |
| Activity IntegratedMath1.2.6.2 | Triangle Transformation Proof Template Handout | 1 | no | no | no | no | no | no |
| Activity IntegratedMath1.2.6.3 | What Do We Know About Isosceles Triangles Handout | 2 | no | yes | no | no | no | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Activity IntegratedMath1.2.7.2 | Triangle Transformation Proof Template Handout | 1 | no | no | no | no | no | no |
| Activity IntegratedMath1.2.7.3 | What Do We Know About Parallelograms Handout | 30 | no | no | no | no | no | no |
| Activity IntegratedMath1.2.8.2 | Lots of Lines (Part 1) Handout | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.2.9.2 | Triangle Transformation Proof Template Handout | 1 | no | no | no | no | no | no |
| Activity IntegratedMath1.2.10.1 | Brace Yourself! Short Strips | 1 | no | yes | yes | yes | no | no |
| Activity IntegratedMath1.2.10.1 | Brace Yourself! Long Strips | 1 | no | yes | yes | yes | no | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Activity IntegratedMath1.2.10.2 | More Practice Seeing Shortcuts Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.2.11.3 | Ambiguously Ambiguous Handout | 30 | no | yes | no | no | no | no |
| Activity IntegratedMath1.2.11.3 | Ambiguously Ambiguous Answer Key | 0 | no | no | no | no | no | no |
| Activity IntegratedMath1.3.4.2 | Matching Distributions Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.3.5.2 | Heartbeats Part 1 Handout | 2 | yes | yes | no | no | no | no |
| Activity IntegratedMath1.3.5.3 | Algebra 1 Unit 1 Useful Terms and Displays | 30 | no | no | no | no | yes | no |
| Activity IntegratedMath1.3.11.2 | Describing Data Distributions Cards | 2 | no | yes | no | no | no | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Activity IntegratedMath1.3.12.3 | Algebra 1 Unit 1 Useful Terms and Displays | 30 | no | no | no | no | yes | no |
| Activity IntegratedMath1.3.13.2 | African and Asian Elephants Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.3.14.1 | Algebra 1 Unit 1 Useful Terms and Displays | 30 | no | no | no | no | yes | no |
| Activity IntegratedMath1.3.16.3 | Heights and Handedness Handout | 2 | no | no | no | no | no | no |
| Activity IntegratedMath1.4.16.3 | What Comes Next Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.4.17.3 | Sorting Systems Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.4.18.3 | Linear Systems Cards | 2 | no | yes | no | no | no | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Activity IntegratedMath1.5.7.2 | Lines Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.5.9.3 | Triangle Types Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.6.1.3 | Running to the Dentist Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.6.5.2 | Data Patterns Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.6.6.3 | Best Residuals Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.6.7.2 | Scatter Plot Fit Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.6.10.2 | Playing Dirty Handout | 2 | no | no | no | no | no | no |
| Activity IntegratedMath1.7.6.3 | Representations of Inequalities Cards | 2 | no | yes | no | no | no | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Activity IntegratedMath1.7.8.3 | Terms of A Team Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.8.10.2 | Possible or Impossible Cards | 2 | no | yes | yes | no | no | no |
| Activity IntegratedMath1.8.12.4 | Piecing It Together Cards | 2 | yes | yes | no | no | no | no |
| Activity IntegratedMath1.8.13.1 | How Good Are Your Guesses Handout | 1 | yes | no | no | no | no | no |
| Activity IntegratedMath1.8.17.2 | Caesar Says, "Shift" Cutouts | 2 | no | yes | yes | no | no | no |
| Activity IntegratedMath1.8.18.3 | Custom Mugs Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.9.6.3 | Matching Descriptions to Graphs Cards | 2 | no | yes | no | no | no | no |
| Activity IntegratedMath1.9.9.4 | Smartphone Sales Cards | 2 | no | yes | no | no | no | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Modeling Prompt: Evaluating a Sample Response to a Modeling Prompt | Modeling Rubric | 1 | yes | no | no | no | no | no |
| Modeling Prompt: Evaluating a Sample Response to a Modeling Prompt | Advice on Modeling | 1 | no | no | no | no | no | no |
| Modeling Prompt: The Garden Wall | Wall Diagram | 1 | yes | no | no | no | no | no |
| Modeling Prompt: The Garden Wall | Modeling Rubric | 1 | yes | no | no | no | no | no |
| Modeling Prompt: The Garden Wall | Advice on Modeling | 1 | no | no | no | no | no | no |
| Modeling Prompt: 2,000 Calories | Food Tables | 1 | yes | no | no | no | no | no |
| Modeling Prompt: 2,000 Calories | Modeling Rubric | 1 | no | no | no | no | no | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Modeling Prompt: 2,000 Calories | Advice on Modeling | 1 | no | no | no | no | no | no |
| Modeling Prompt: How Much Water? | Modeling Rubric | 1 | yes | no | no | no | no | no |
| Modeling Prompt: How Much Water? | Advice on Modeling | 1 | no | no | no | no | no | no |
| Modeling Prompt: Display Your Data | Advice on Modeling | 1 | no | no | no | no | no | no |
| Modeling Prompt: Display Your Data | Modeling Rubric | 1 | yes | no | no | no | no | no |
| Modeling Prompt: A New Town | Advice on Modeling | 1 | no | no | no | no | no | no |
| Modeling Prompt: A New Town | Modeling Rubric | 1 | yes | no | no | no | no | no |
| Modeling Prompt: College Characteristics | Advice on Modeling | 1 | no | no | no | no | no | no |

| address | title | students per copy | written on? | requires cutting? | card stock recommended? | color paper recommended? | used multiple times? | used as a center material? |
|---|---|---|---|---|---|---|---|---|
| Modeling Prompt: College Characteristics | Modeling Rubric | 1 | yes | no | no | no | no | no |
| Modeling Prompt: College Characteristics | College Data for Task Statement 1 | 1 | no | no | no | no | no | no |
| Modeling Prompt: College Characteristics | College Data for Task Statement 2 | 1 | no | no | no | no | no | no |
| Modeling Prompt: A New Heating System | Advice on Modeling | 1 | no | no | no | no | no | no |
| Modeling Prompt: A New Heating System | Modeling Rubric | 1 | yes | no | no | no | no | no |
| Modeling Prompt: Giving Bonuses | Modeling Rubric | 1 | yes | no | no | no | no | no |
| Modeling Prompt: Giving Bonuses | Advice on Modeling | 1 | no | no | no | no | no | no |
| Modeling Prompt: Planning a Vacation | Modeling Rubric | 1 | yes | no | no | no | no | no |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Modeling Prompt: Planning a Vacation | Advice on Modeling | 1 | no | no | no | no | no | no |
| Modeling Prompt: Critically Examining National Debt | US National Debt Data | 1 | no | no | no | no | no | no |
| Modeling Prompt: Critically Examining National Debt | Modeling Rubric | 1 | yes | no | no | no | no | no |
| Modeling Prompt: Critically Examining National Debt | Advice on Modeling | 1 | no | no | no | no | no | no |

INTEGRATED MATH 1

UNIT

# 1

## Teacher Resource Copy Masters

## LESSON BLACKLINE MASTERS

| date, type | statement | diagram |
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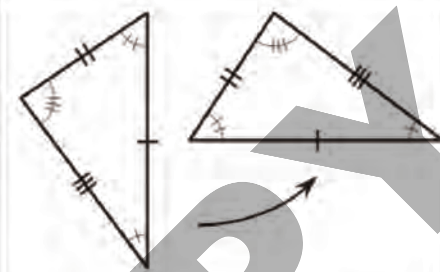
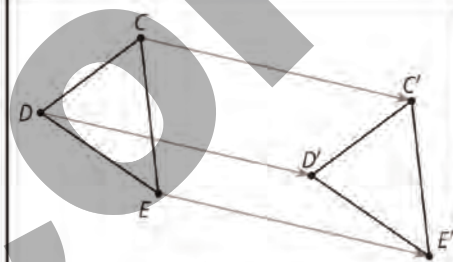
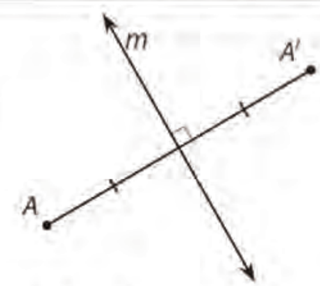
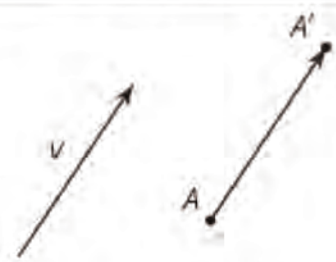
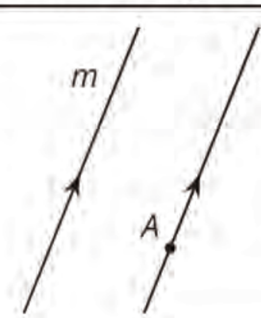
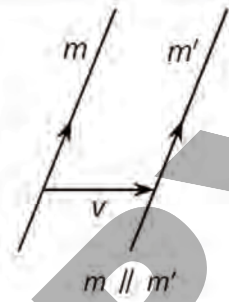
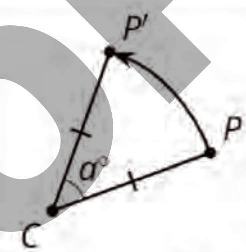
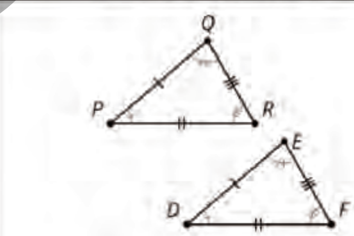
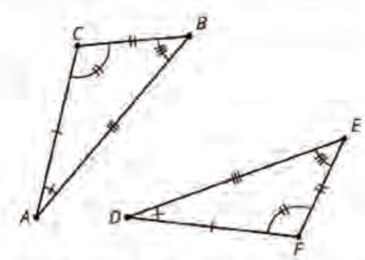
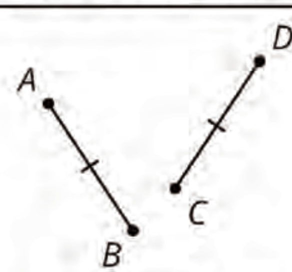
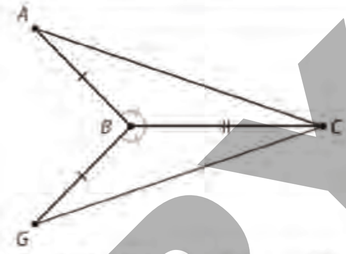
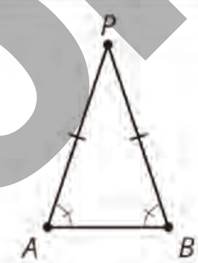
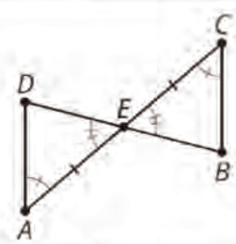
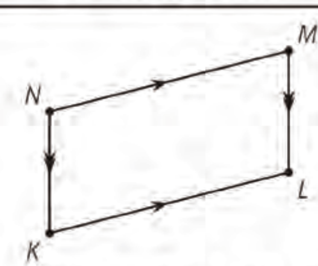
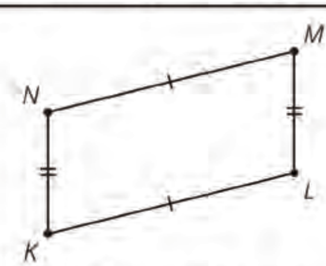
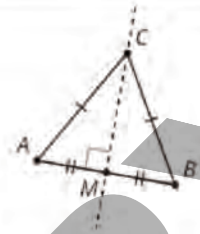
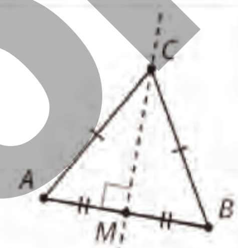
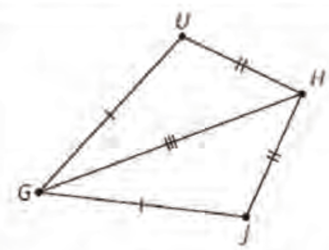
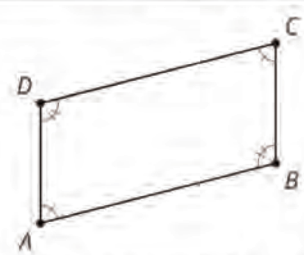
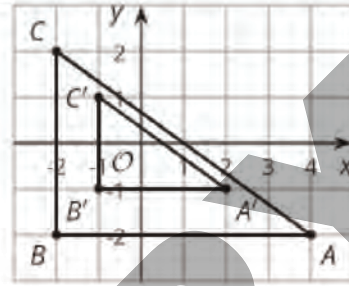
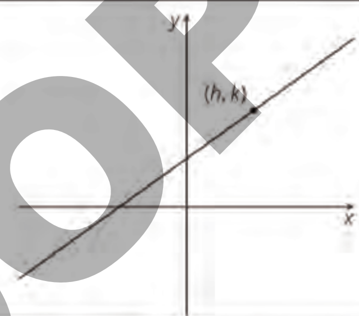
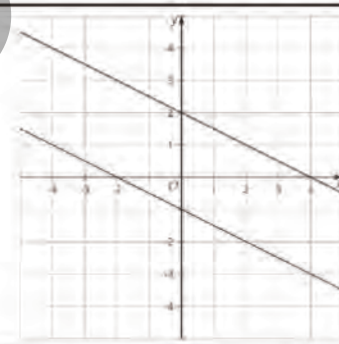
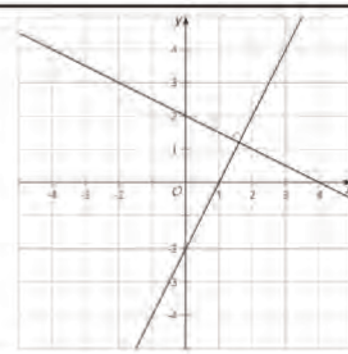
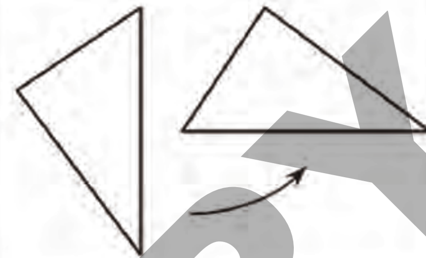
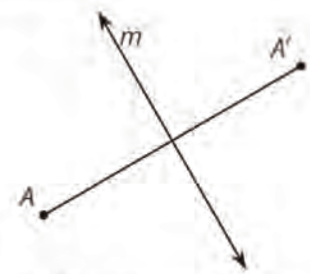
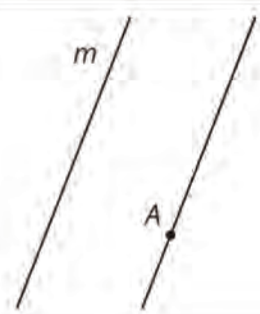
| lesson, type | statement | diagram |
|---|---|---|
| U1, L10<br><br>(students write the date)<br><br>assertion | A **rigid transformation** is a translation, reflection, rotation, or any sequence of the three.<br>Rigid transformations take lines to lines, angles to angles of the same measure, and segments to segments of the same length. |  |
| U1, L10<br><br>definition | Two figures are **congruent** if there is a sequence of translations, rotations, and reflections that takes one figure exactly onto the other.<br>The second figure is called the image of the rigid transformation. | <br><br>$\triangle EDC \cong \triangle E'D'C'$ |
| U1, L11<br><br>definition | **Reflection** is a rigid transformation that takes a point to another point that is the same distance from the given line, that is on the other side of the given line, and so that the segment from the original point to the image is perpendicular to the given line.<br>"Reflect <u>(object)</u> across line <u>(name)</u>." | <br><br>Reflect *A* across line *m*. |
| U1, L12<br><br>definition | **Translation** is a rigid transformation that takes a point to another point so that the directed line segment from the original point to the image is parallel to the given line segment and has the same length and direction.<br>"Translate <u>(object)</u> by the directed line segment <u>(name or from [point] to [point])</u>." | <br><br>Translate *A* by the directed line segment *v*. |
| U1, L12<br><br>assertion | **Parallel Postulate:** Given a line *m* and a point *A* that is not on *m*, there is exactly one line that goes through *A* that is parallel to *m*. | <br> |

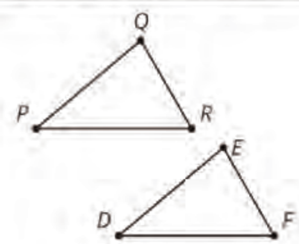
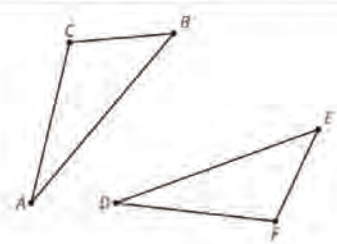
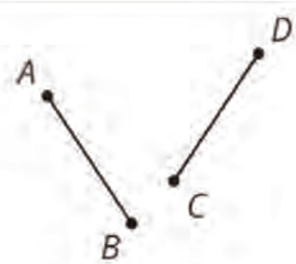
| lesson, type | statement | diagram |
|---|---|---|
| U1, L12 theorem | Translations take lines to parallel lines or to themselves. |   |
| U1, L14 definition | **Rotation** is a rigid transformation that takes a point to another point on the circle through the original point with the given center. The two radii, the one from the center to the original point and the one from the center to the image, make the given angle.<br>"Rotate _(object)_ (clockwise or counterclockwise) by _(angle or angle measure)_ using center _(point)_." |   Rotate *P* counterclockwise by $a°$ using center *C*. |
| U2, L1 theorem | If two figures are congruent, then **corresponding** parts of those figures must be congruent |   $\triangle DEF \cong \triangle PQR$ so $\overline{PQ} \cong \overline{DE}$, $\overline{PR} \cong \overline{DF}$, $\overline{QR} \cong \overline{EF}$, $\angle P \cong \angle D$, $\angle Q \cong \angle E$, $\angle R \cong \angle F$ |
| U2, L3 theorem | If all pairs of corresponding sides and all pairs of corresponding angles are congruent, then the triangles must be congruent. |   $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, $\overline{AC} \cong \overline{DF}$, $\angle A \cong \angle D$, $\angle B \cong \angle E$, $\angle C \cong \angle F$ so $\triangle ABC \cong \triangle DEF$ |
| U2, L5 theorem | If two segments have the same length, then they are congruent. |   $AB = CD$, so $\overline{AB} \cong \overline{CD}$ |

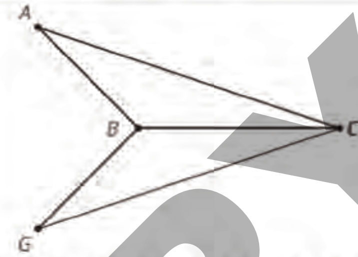
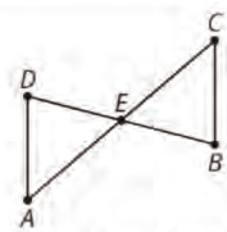
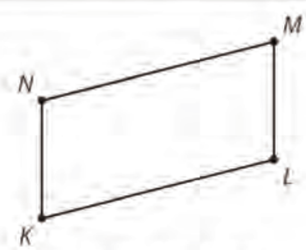
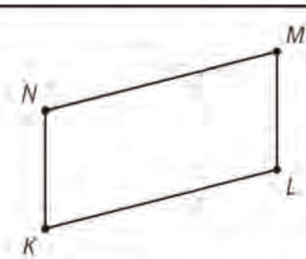
| lesson, type | statement | diagram |
| --- | --- | --- |
| U2, L6<br><br>theorem | **Side-Angle-Side Triangle Congruence Theorem:** In two triangles, if two pairs of congruent corresponding sides and the pair of corresponding angles between the sides are congruent, then the two triangles are congruent. | <br>$\overline{AB} \cong \overline{GB}$, $\overline{BC} \cong \overline{BC}$, $\angle ABC \cong \angle GBC$ so $\triangle ABC \cong \triangle GBC$ |
| U2, L6<br><br>theorem | **Isosceles Triangle Theorem:** In an isosceles triangle, the base angles are congruent. | <br>$\overline{AP} \cong \overline{PB}$, so $\angle A \cong \angle B$ |
| U2, L7<br><br>theorem | **Angle-Side-Angle Triangle Congruence Theorem:** In two triangles, if two pairs of corresponding angles are congruent and the pair of corresponding sides between the angles is congruent, then the triangles must be congruent. | <br>$\angle A \cong \angle C$, $\overline{AE} \cong \overline{EC}$, $\angle DEA \cong \angle BEC$, so $\triangle DEA \cong \triangle BEC$ |
| U2, L7<br><br>definition | A **parallelogram** is a quadrilateral with two pairs of opposite sides parallel. | <br>$NM \parallel KL$, $NK \parallel ML$, so $MNKL$ is a parallelogram |
| U2, L7<br><br>theorem | In a parallelogram, pairs of opposite sides are congruent. | <br>$MNKL$ is a parallelogram, so $\overline{NM} \cong \overline{KL}$, $\overline{NK} \cong \overline{ML}$ |

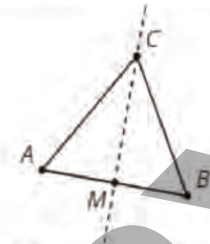
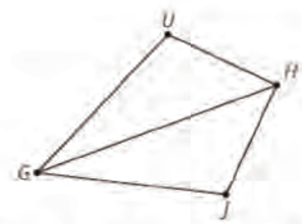
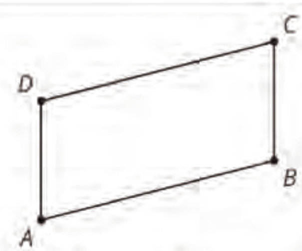
| lesson, type | statement | diagram |
| --- | --- | --- |
| U2, L8<br>theorem | If a point *C* is the same distance from *A* as it is from *B*, then *C* must be on the perpendicular bisector of *AB*. | <br>$\overline{AC} \cong \overline{BC}$, so *C* is on the line through midpoint *M* perpendicular to $\overline{AB}$. |
| U2, L8<br>theorem | If *C* is a point on the perpendicular bisector of *AB*, the distance from *C* to *A* is the same as the distance from *C* to *B*. | <br>$AB \perp CM$, $\overline{AM} \cong \overline{BM}$, so $\overline{AC} \cong \overline{BC}$ |
| U2, L9<br>theorem | **Side-Side-Side Triangle Congruence Theorem:** In two triangles, if all three pairs of corresponding sides are congruent, then the triangles must be congruent. | <br>$\overline{HU} \cong \overline{HJ}$, $\overline{UG} \cong \overline{JG}$, $\overline{HG} \cong \overline{HG}$, so $\triangle HUG \cong \triangle HJG$ |
| U2, L9<br>theorem | In a parallelogram, opposite angles are congruent. | <br>*ABCD* is a parallelogram, so $\angle A \cong \angle C$, $\angle D \cong \angle B$ |

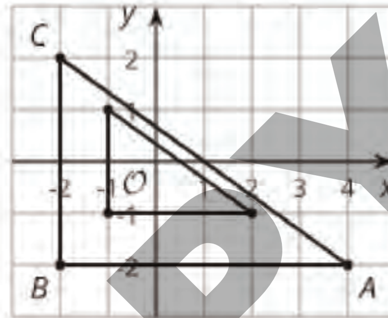
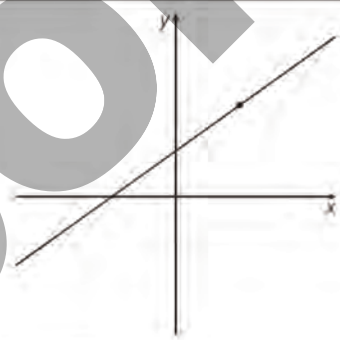
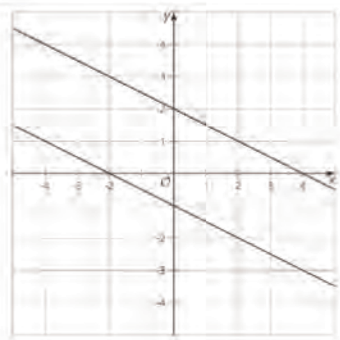
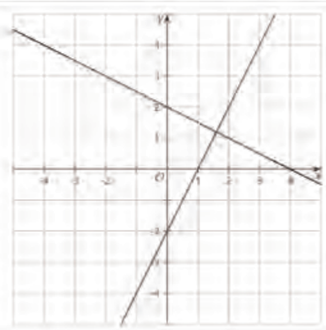
| lesson, type | statement | diagram |
|---|---|---|
| U5, L2<br>definition | A **dilation** is a transformation in which each point on a figure moves along a line and changes its distance from a fixed point, called the "center of dilation." All of the original distances are multiplied by the same scale factor. |  |
| U5, L4<br>definition | The **point-slope form** of the equation of a line is $y - k = m(x - h)$ where $(h, k)$ is a particular point on the line and $m$ is the slope of the line. |  |
| U5, L5<br>theorem | Lines are parallel if and only if they have equal slopes. |  |
| U5, L6<br>theorem | Lines are perpendicular if and only if their slopes are opposite reciprocals. |  |

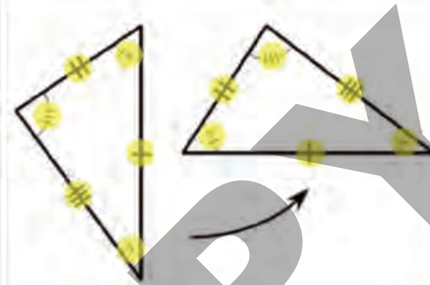
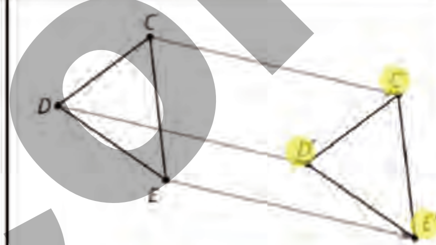
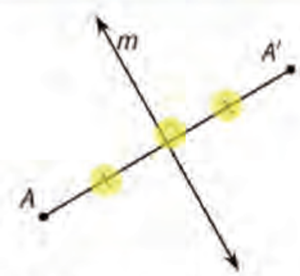
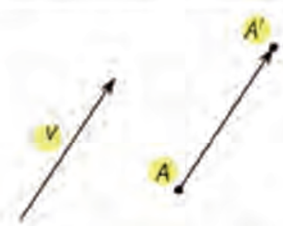
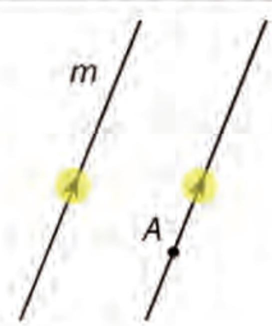
| date, type | statement | diagram |
|---|---|---|
| assertion | A ____________ is a ____________, ____________, ____________, or any sequence of the three.<br>Rigid transformations take lines to ____________, angles to ____________ of the same measure, and segments to ____________ of the same length. |  |
| definition | One figure is ____________ to another if there is a sequence of ____________, ____________, and ____________ that takes the first figure ____________ onto the second figure.<br>The second figure is called the ____________ of the rigid transformation. | <br> |
| definition | ____________ is a rigid transformation that takes a point to another point that is the same ____________ from the given line, on the other side of the given line, and so that the segment from the original point to the image is ____________ to the given line.<br>"Reflect <u>(object)</u> across line <u>(name)</u>." | <br><br>Reflect *A* across line *m*. |
| definition | ____________ is a rigid transformation that takes a point to another point so that the directed ____________ from the original point to the image is ____________ to the given line segment and has the same ____________ and ____________.<br>"Translate <u>(object)</u> by the directed line segment <u>(name or from [point] to [point])</u>." | <br>Translate *A* by the directed line segment *v*. |
| assertion | **Parallel Postulate:**<br>Given a ____________ *m* and a ____________ *A* that is not on ____, there is exactly ____________ that goes through *A* that is ____________ to *m*. | <br> |

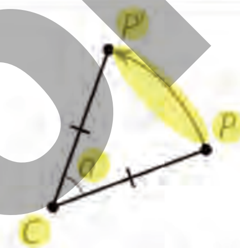
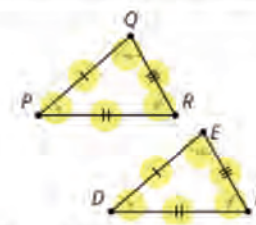
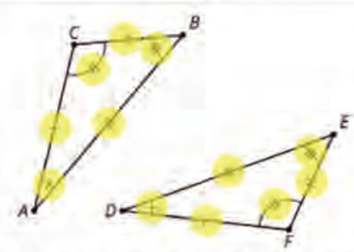
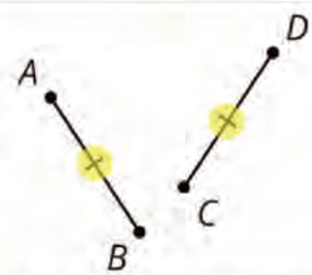
| date, type | statement | diagram |
|---|---|---|
| theorem | ______ take lines to ______ or to ______. |   |
| definition | ______ is a ______ transformation that takes a point to another point on the circle through the original point with the given ______. The two radii to the original point and the image make the given ______.<br>"Rotate _(object)_ (clockwise or counterclockwise) by _(angle or angle measure)_ using center _(point)_." | <br>Rotate $P$ counterclockwise by $a°$ using center $C$. |
| theorem | If two figures are ______, then ______ parts of those figures must be ______. |  <br>$\triangle PQR \cong \triangle DEF$ so $PQ=DE$, $PR=DF$, $QR=EF$, $\angle P \cong \angle D$, $\angle Q \cong \angle E$, $\angle R \cong \angle F$ |
| theorem | If all pairs of corresponding ______ and all pairs of corresponding ______ are congruent, then the ______ must be ______. |  <br>$AB=DE$, $BC=EF$, $CA=FD$, $\angle B \cong \angle E$, $\angle A \cong \angle D$, $\angle C \cong \angle F$ so |
| theorem | If two ______ have the same ______, then they are ______. |   |

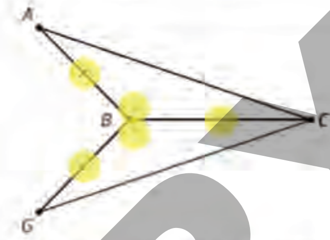
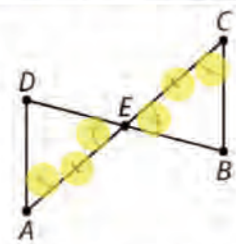
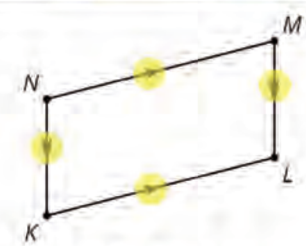
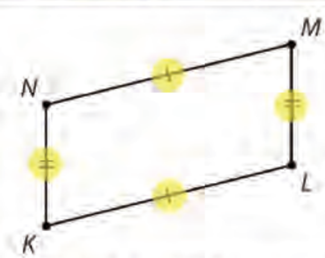
| date, type | statement | diagram |
|---|---|---|
| theorem | ______________ **Triangle Congruence Theorem:** In two triangles, if two pairs of congruent ______________ and the pair of corresponding ______________ between the sides are ______________, then the two triangles are ______________. |  $AB \cong GB$, $BC=BC$, $\angle ABC \cong \angle GBC$ so |
| theorem | ______________ **Triangle Theorem:** In an ______________ triangle, the ______________ are ______________. |  |
| theorem | ______________ **Triangle Congruence Theorem:** In two triangles, if two pairs of corresponding ______________, and the pair of corresponding ______________ between the angles are ______________, then the triangles must be ______________. |  $\angle A \cong \angle C$, $AE=EC$, $\angle DEA \cong \angle BEC$, so |
| definition | A ______________ is a quadrilateral with two pairs of ______________ sides ______________. |  $NM \parallel KL$, $NK \parallel ML$, so |
| theorem | In a ______________, pairs of ______________ sides are ______________. |  *MNKL* is a parallelogram, so |

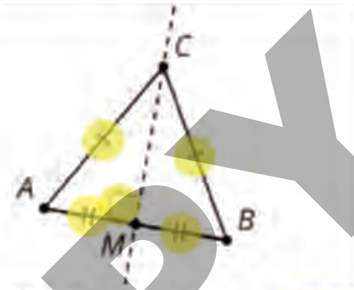
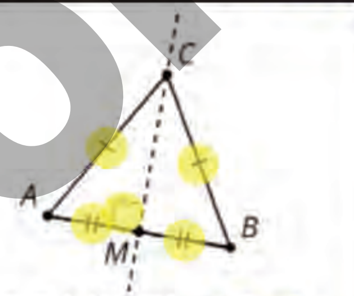
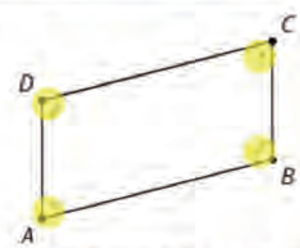
| **date, type** | **statement** | **diagram** |
|---|---|---|
| theorem | If a ____________ *C* is the same ____________ from ____ as it is from ____, then *C* must be on the ________________________ of *AB*. | <br>*AC*=*BC*, *M* is the midpoint, so |
| theorem | If *C* is a point on the ________________________ of segment *AB*, the distance from ____ to ____ is the same as the ____________ from ____ to ____. | <br>*AB*⊥*CM*, *AM*=*BM*, so |
| theorem | ____________________________________ **Triangle Congruence Theorem:** In two triangles, if ________________________ of corresponding ____________ are congruent, then the triangles must be ____________. | <br>*HU*=*HJ*, *UG*=*JG*, *HG*=*HG* so |
| theorem | In a ____________, ____________ angles are ____________. | <br>*ABCD* is a parallelogram, so |

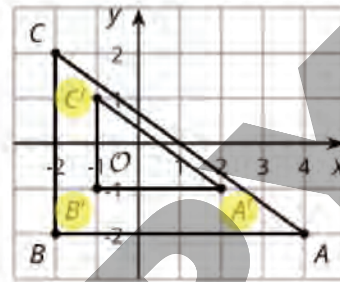
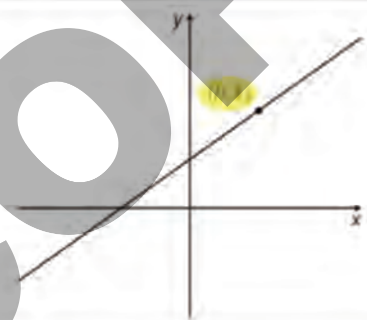
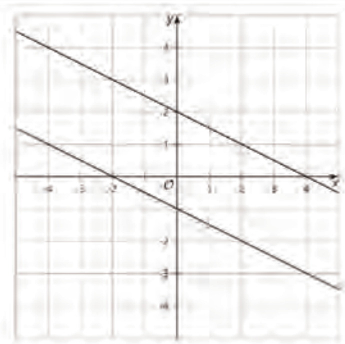
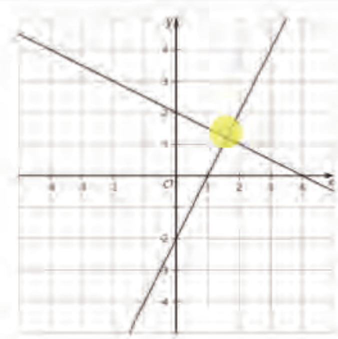
| **date, type** | **statement** | **diagram** |
|---|---|---|
| definition | A __________ is a transformation in which each point on a figure moves along a line and changes its distance from a fixed point, called the "______________." All of the original distances are multiplied by the same ____________. |  |
| definition | The ________________________ form of the equation of a line is ________________________ where $(h, k)$ is a particular ____________ on the line and $m$ is the ____________ of the line. |  |
| theorem | Lines are ____________ if and only if they have ________________________. |  |
| theorem | Lines are ____________ if and only if their ____________ are ________________________. |  |

| lesson, type | statement | diagram |
|---|---|---|
| U1, L10<br>(students write the date)<br>assertion | A **rigid transformation** is a translation, reflection, rotation, or any sequence of the three.<br>Rigid transformations take lines to lines, angles to angles of the same measure, and segments to segments of the same length. |  |
| U1, L10<br>definition | One figure is **congruent** to another if there is a sequence of translations, rotations, and reflections that takes the first figure exactly onto the second figure.<br>The second figure is called the image of the rigid transformation. | <br>$\triangle EDC \cong \triangle E'D'C'$ |
| U1, L11<br>definition | **Reflection** is a rigid transformation that takes a point to another point that is the same distance from the given line, is on the other side of the given line, and so that the segment from the original point to the image is perpendicular to the given line.<br>"Reflect _(object)_ across line _(name)_." | <br>Reflect *A* across line *m*. |
| U1, L12<br>definition | **Translation** is a rigid transformation that takes a point to another point so that the directed line segment from the original point to the image is parallel to the given line segment and has the same length and direction.<br>"Translate _(object)_ by the directed line segment _(name or from [point] to [point])_." | <br>Translate *A* by the directed line segment *v*. |
| U1, L12<br>assertion | **Parallel Postulate:** Given a line *m* and a point *A* that is not on *m*, there is exactly one line that goes through *A* that is parallel to *m*. |  |

| lesson, type | statement | diagram |
|---|---|---|
| U1, L12<br>theorem | Translations take lines to parallel lines or to themselves. |   |
| U1, L14<br>definition | **Rotation** is a rigid transformation that takes a point to another point on the circle through the original point with the given center. The two radii to the original point and the image make the given angle.<br>"Rotate _(object)_ (clockwise or counterclockwise) by _(angle or angle measure)_ using center _(point)_." |  <br>Rotate *P* counterclockwise by *a*° using center *C*. |
| U2, L1<br>theorem | If two figures are congruent, then **corresponding** parts of those figures must be congruent |  <br>$\triangle PQR \cong \triangle DEF$ so *PQ=DE, PR=DF, QR=EF,* ∠*P*≅∠*D,* ∠*Q*≅∠*E,* ∠*R*≅∠*F* |
| U2, L3<br>theorem | If all pairs of corresponding sides and all pairs of corresponding angles are congruent, then the triangles must be congruent. |  <br>*AB=DE, BC=EF, CA=FD,* ∠*B*≅∠*E,* ∠*A*≅∠*D,* ∠*C*≅∠*F* so $\triangle ABC \cong \triangle DEF$ |
| U2, L5<br>theorem | If two segments have the same length, then they are congruent. |  <br>$AB = CD$ so, $\overline{AB} \cong \overline{CD}$ |

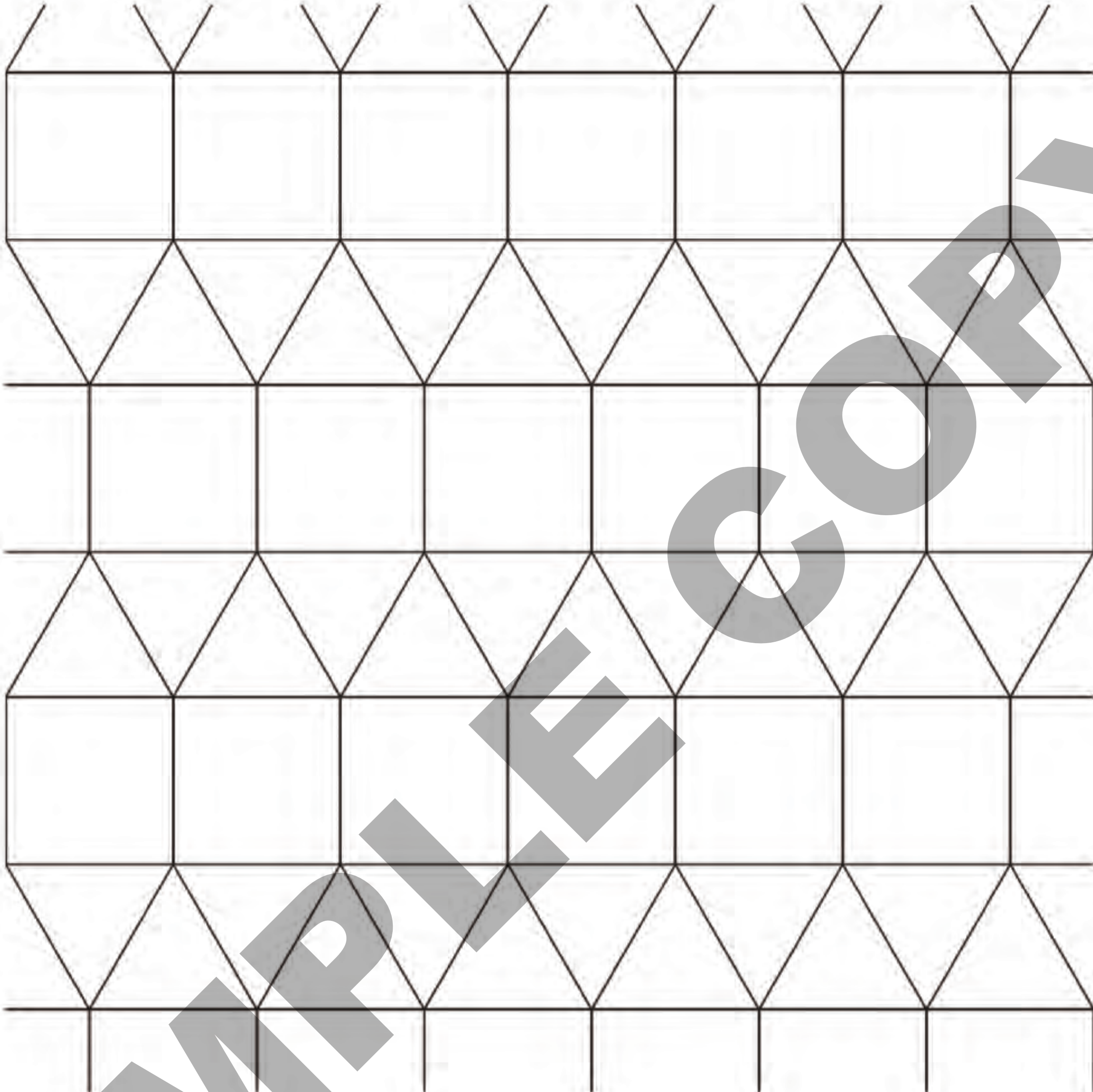
| lesson, type | statement | diagram |
|---|---|---|
| U2, L6<br>theorem | **Side-Angle-Side Triangle Congruence Theorem:** In two triangles, if two pairs of congruent corresponding sides and the pair of corresponding angles between the sides are congruent, then the two triangles are congruent. | <br>$AB=GB$, $BC=BC$, $\angle ABC \cong \angle GBC$ so $\triangle ABC \cong \triangle GBC$ |
| U2, L6<br>theorem | **Isosceles Triangle Theorem:** In an isosceles triangle, the base angles are congruent. | <br>$AP=PB$ so $\angle A \cong \angle B$ |
| U2, L7<br>theorem | **Angle-Side-Angle Triangle Congruence Theorem:** In two triangles, if two pairs of corresponding angles, and the pair of corresponding sides between the angles are congruent, then the triangles must be congruent. | <br>$\angle A \cong \angle C$, $AE=EC$, $\angle DEA \cong \angle BEC$, so $\triangle DEA \cong \triangle BEC$ |
| U2, L7<br>definition | A **parallelogram** is a quadrilateral with two pairs of opposite sides parallel. | <br>$NM \parallel KL$, $NK \parallel ML$, so $MNKL$ is a parallelogram |
| U2, L7<br>theorem | In a parallelogram, pairs of opposite sides are congruent. | <br>$MNKL$ is a parallelogram, so $NM=KL$, $NK=ML$ |

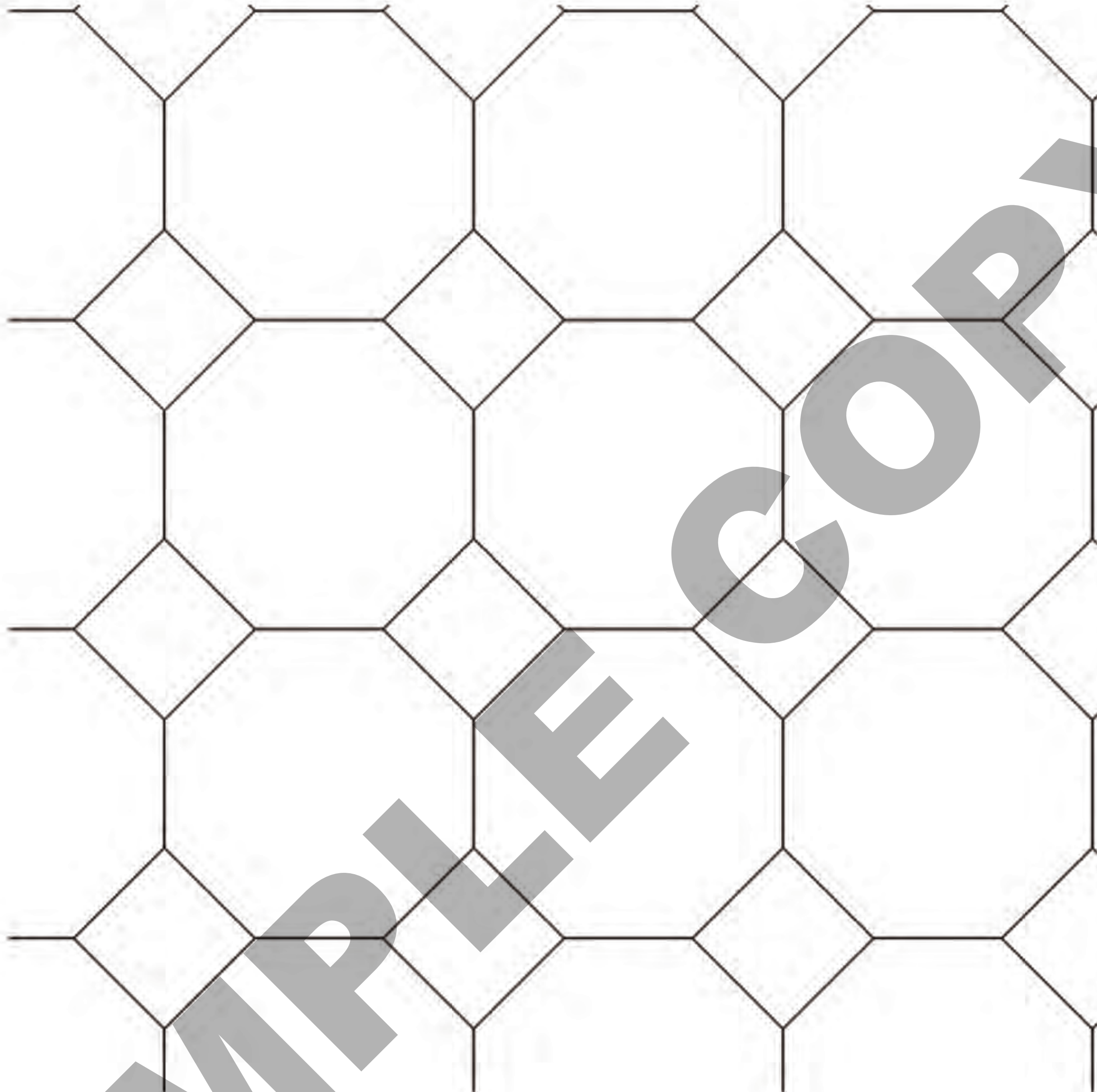
| lesson, type | statement | diagram |
|---|---|---|
| U2, L8<br>theorem | If a point *C* is the same distance from *A* as it is from *B*, then *C* must be on the perpendicular bisector of *AB*. | <br>*AC*=*BC*, *M* is the midpoint, so *MC*⊥*AB* |
| U2, L8<br>theorem | If *C* is a point on the perpendicular bisector of segment *AB*, the distance from *C* to *A* is the same as the distance from *C* to *B*. | <br>*AB*⊥*CM*, *AM*=*BM*, so *AC*=*BC* |
| U2, L9<br>theorem | **Side-Side-Side Triangle Congruence Theorem:** In two triangles, if all three pairs of corresponding sides are congruent, then the triangles must be congruent. | <br>*HU*=*HJ*, *UG*=*JG*, *HG*=*HG* so $\triangle HUG \cong \triangle HJG$ |
| U2, L9<br>theorem | In a parallelogram, opposite angles are congruent. | <br>*ABCD* is a parallelogram, so $\angle A \cong \angle C$, $\angle D \cong \angle B$ |

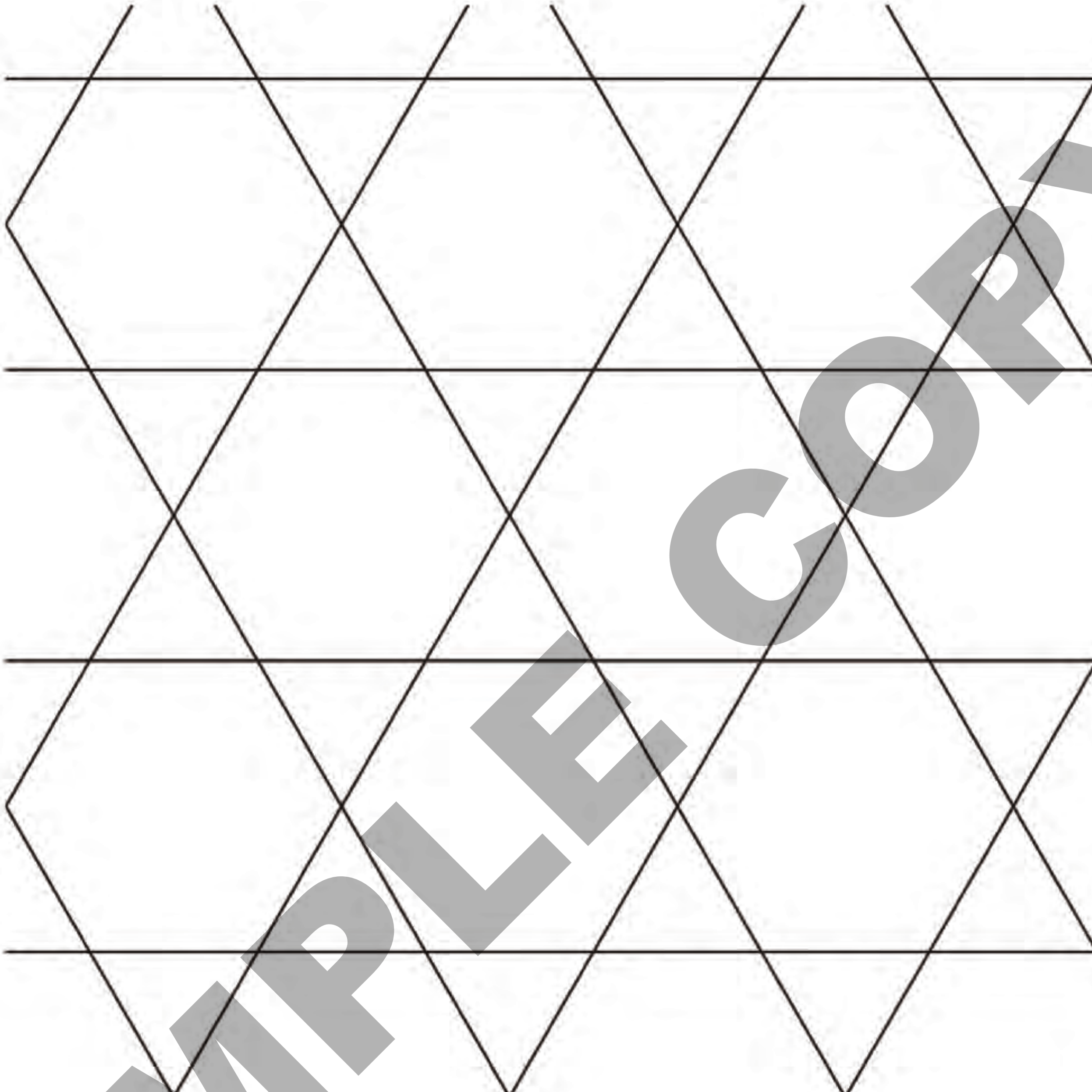
| lesson, type | statement | diagram |
|---|---|---|
| U5, L2<br>definition | A **dilation** is a transformation in which each point on a figure moves along a line and changes its distance from a fixed point, called the "center of dilation." All of the original distances are multiplied by the same scale factor. |  |
| U5, L4<br>definition | The **point-slope form** of the equation of a line is $y - k = m(x - h)$ where $(h, k)$ is a particular point on the line and $m$ is the slope of the line. |  |
| U5, L5<br>theorem | Lines are parallel if and only if they have equal slopes. |  |
| U5, L6<br>theorem | Lines are perpendicular if and only if their slopes are opposite reciprocals. |  |

## Math Community

| Doing Math | Norms |
| --- | --- |
| **Students** | **Students** |
| Looks like / Sounds like | |
| **Teacher** | **Teacher** |
| Looks like / Sounds like | |







| date, type | statement | diagram |
|---|---|---|
| | | |
| | | |
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| | | |
| | | |

Info Gap: What's the Point: Reflections

## Problem Card 1

Triangle $GEN$ has been reflected so that the vertices of its image are labeled points. What is the image of triangle $GEN$?

Info Gap: What's the Point: Reflections

## Data Card 1

- The image of $A$ is $L$ and the image of $L$ is $A$.
- The image of $G$ is $G$.
- The image of $N$ is $U$ and the image of $U$ is $N$.
- The image of $P$ is $T$ and the image of $T$ is $P$.
- The image of $R$ is $R$.

Info Gap: What's the Point: Reflections

## Problem Card 2

Several points have been reflected across a line that goes through 2 of the labeled points. Precisely describe the reflection.

Info Gap: What's the Point: Reflections

## Data Card 2

- The image of $A$ is $G$ and the image of $G$ is $A$.
- The image of$D$ is $D$.
- The image of $I$ is $V$ and the image of $V$ is $I$.
- The image of $J$ is $T$ and the image of $T$ is $J$.
- The image of $L$ is $Q$ and the image of $Q$ is $L$.
- The image of $N$ is $N$.

This page includes an additional set of info gap cards to use as an optional demonstration.

Cards for the student activity are located on the following page.

Info Gap: What's the Point?: Rotations

## Problem Card 0

Triangle $JKF$ has been rotated so that the vertices of its image are labeled points. What is its image?

Info Gap: What's the Point?: Rotations

## Data Card 0

- The angle of rotation is $KMC$.
- The rotation is clockwise.
- The center of rotation is $M$.
- The image of $M$ is $M$.
- The image of $G$ is $U$.

Info Gap: What's the Point?: Rotations

## Problem Card 0

Triangle $JKF$ has been rotated so that the vertices of its image are labeled points. What is its image?

Info Gap: What's the Point?: Rotations

## Data Card 0

- The angle of rotation is $KMC$.
- The rotation is clockwise.
- The center of rotation is $M$.
- The image of $M$ is $M$.
- The image of $G$ is $U$.

Info Gap: What's the Point?: Rotations

## Problem Card 0

Triangle $JKF$ has been rotated so that the vertices of its image are labeled points. What is its image?

Info Gap: What's the Point?: Rotations

## Data Card 0

- The angle of rotation is $KMC$.
- The rotation is clockwise.
- The center of rotation is $M$.
- The image of $M$ is $M$.
- The image of $G$ is $U$.

Info Gap: What's the Point?: Rotations

## Problem Card 1

Triangle $DCI$ has been rotated so that the vertices of its image are labeled points. What is its image?

Info Gap: What's the Point?: Rotations

## Data Card 1

- The angle of rotation is $HLI$.
- The rotation is counterclockwise.
- The center of rotation is $L$.
- The image of $C$ is $G$.
- The image of $I$ is $H$.
- The image of $L$ is $L$.
- The image of $V$ is $D$.

Info Gap: What's the Point?: Rotations

## Problem Card 2

Several points have been rotated around a labeled point. Precisely describe the rotation.

Info Gap: What's the Point?: Rotations

## Data Card 2

- The angle of rotation is $HNW$.
- The center of rotation is $N$.
- The image of $F$ is $H$.
- The image of $H$ is $W$.
- The image of $J$ is $B$.
- The image of $N$ is $N$.

Info Gap: What's the Point?: Rotations

## Problem Card 1

Triangle $DCI$ has been rotated so that the vertices of its image are labeled points. What is its image?

Info Gap: What's the Point?: Rotations

## Data Card 1

- The angle of rotation is $HLI$.
- The rotation is counterclockwise.
- The center of rotation is $L$.
- The image of $C$ is $G$.
- The image of $I$ is $H$.
- The image of $L$ is $L$.
- The image of $V$ is $D$.

Info Gap: What's the Point?: Rotations

## Problem Card 2

Several points have been rotated around a labeled point. Precisely describe the rotation.

Info Gap: What's the Point?: Rotations

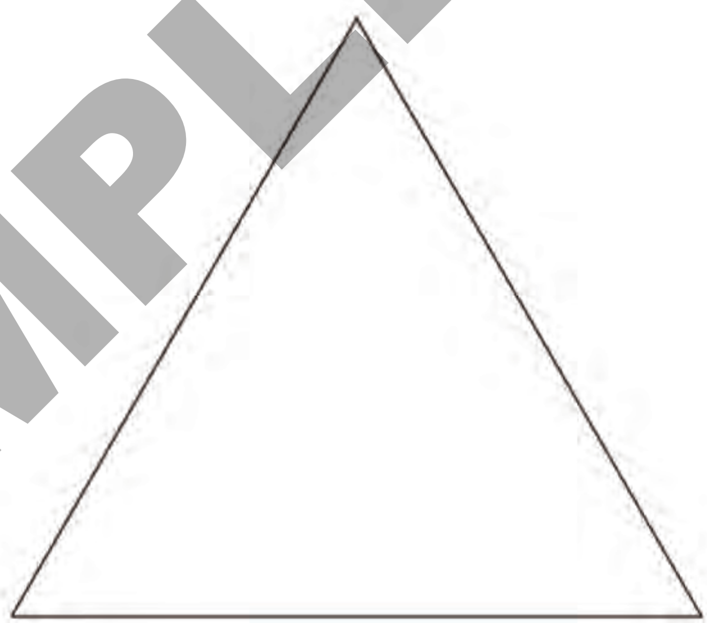
## Data Card 2

- The angle of rotation is $HNW$.
- The center of rotation is $N$.
- The image of $F$ is $H$.
- The image of $H$ is $W$.
- The image of $J$ is $B$.
- The image of $N$ is $N$.

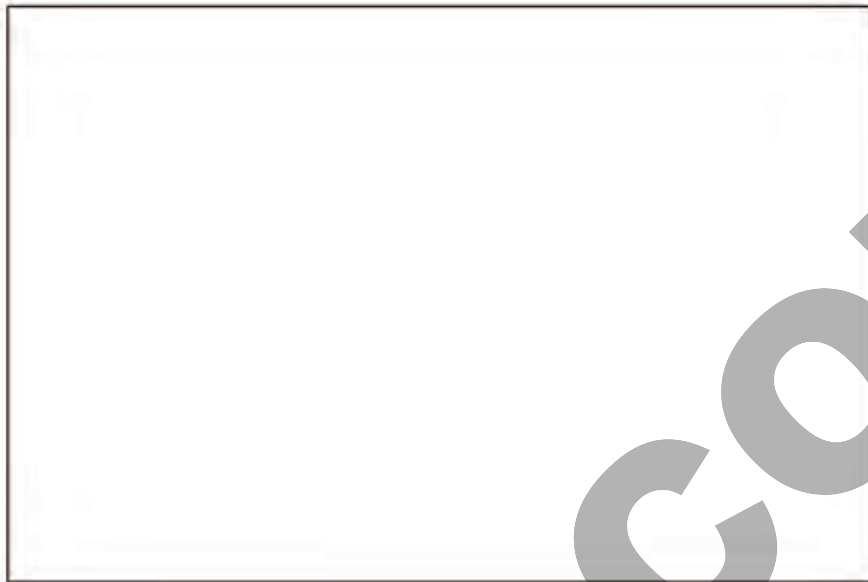


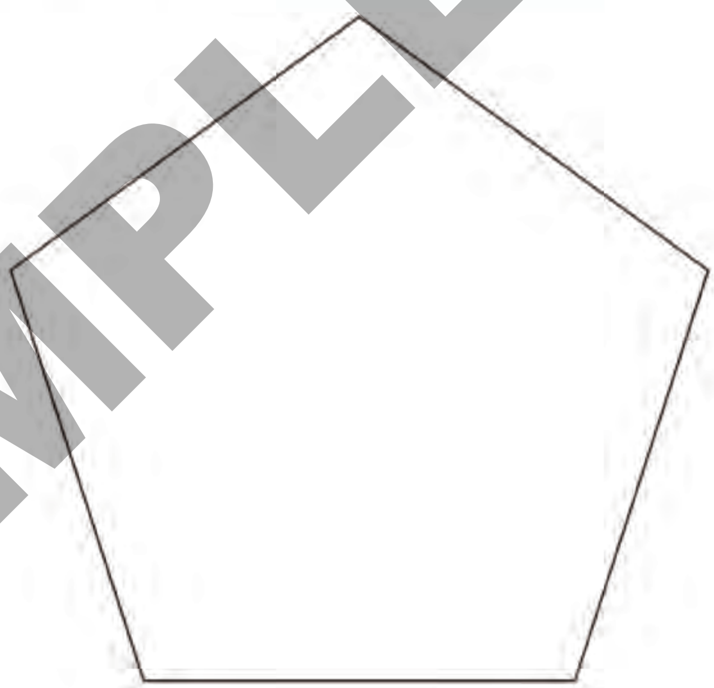
Isosceles trapezoid



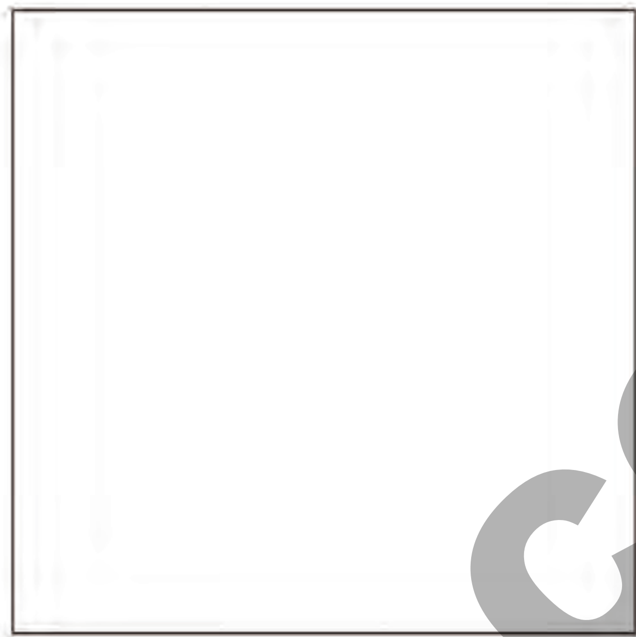
Equilateral triangle



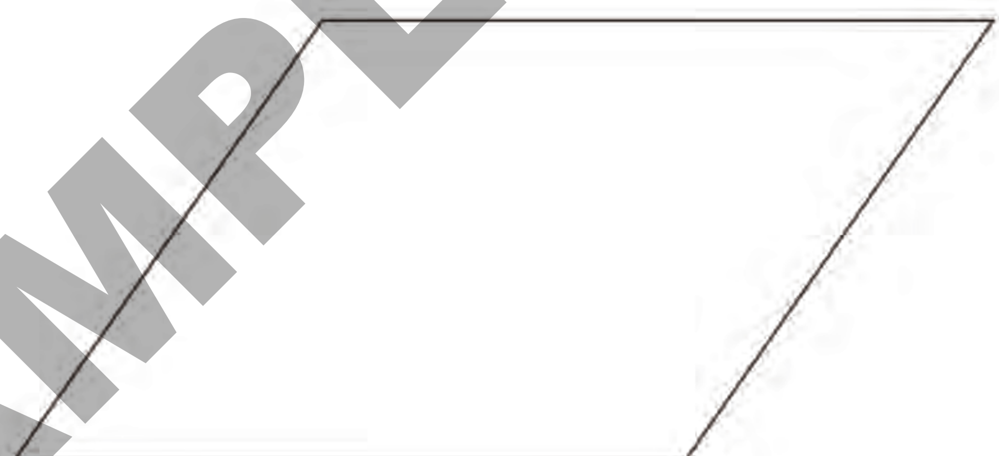
Rectangle that is not a square



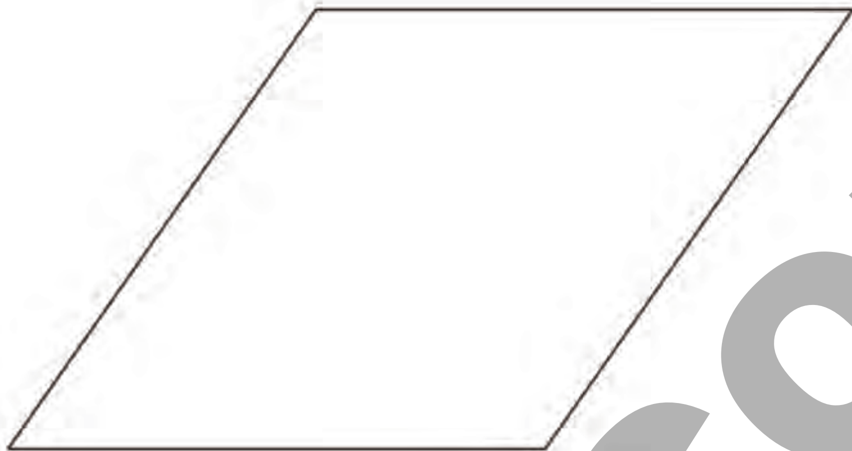
Regular pentagon



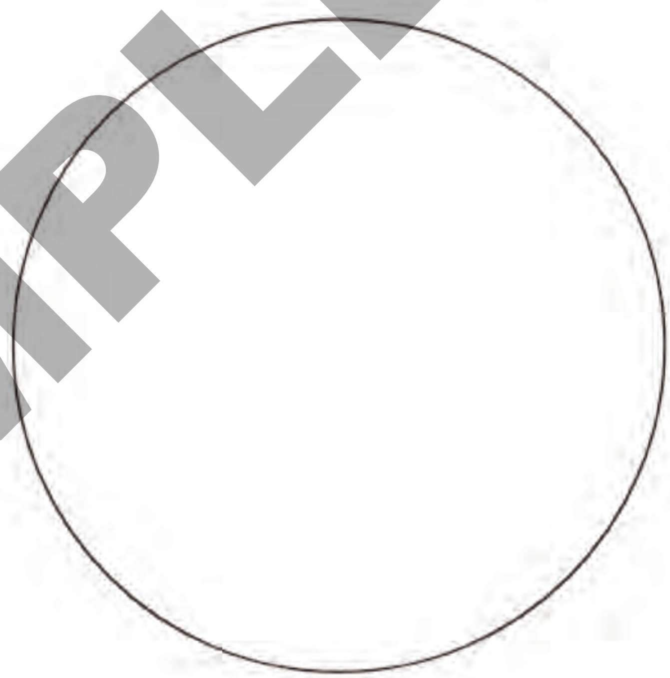
Rectangle that is a square



Parallelogram that is not a rhombus



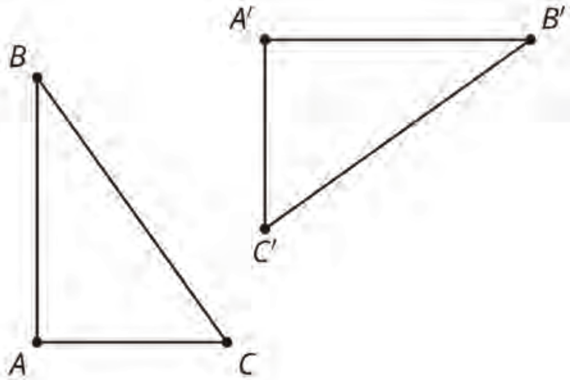
Parallelogram that is a rhombus



Circle

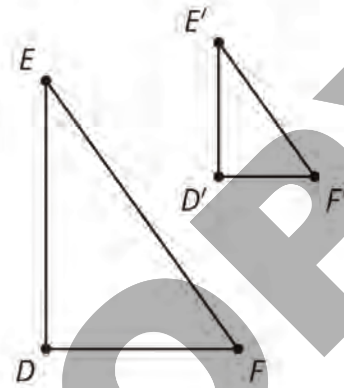
Card Sort: How Did This Get There?

## Card 1



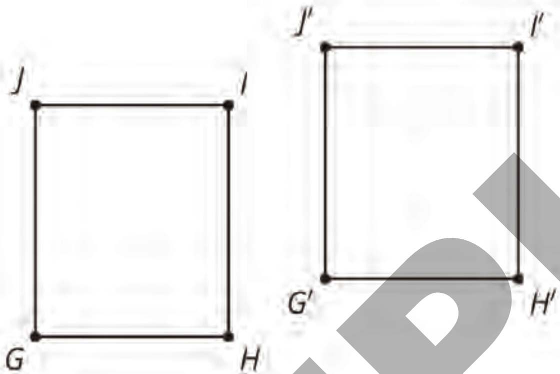

Card Sort: How Did This Get There?

## Card 2



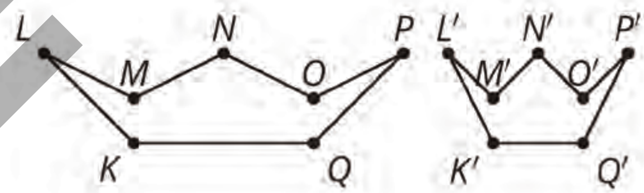

Card Sort: How Did This Get There?

## Card 3



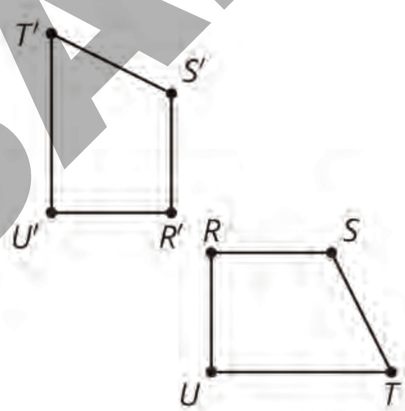

Card Sort: How Did This Get There?

## Card 4



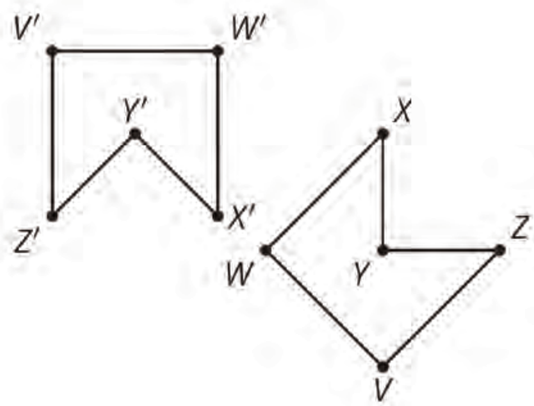

Card Sort: How Did This Get There?

## Card 5




Card Sort: How Did This Get There?

## Card 6



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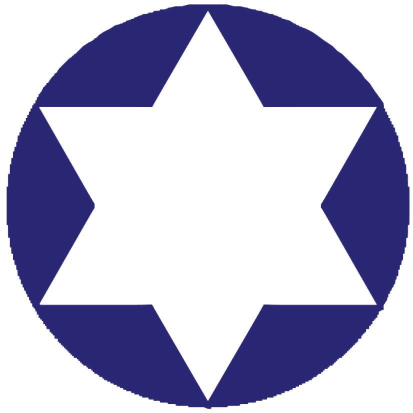

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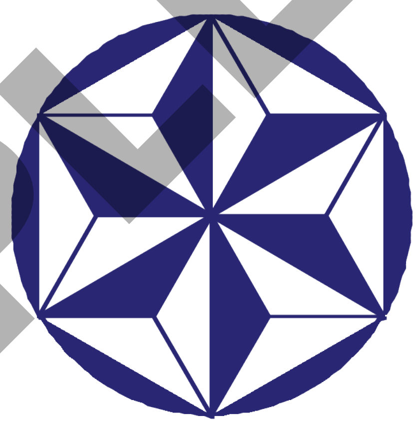

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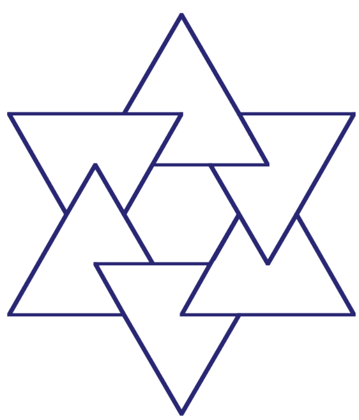

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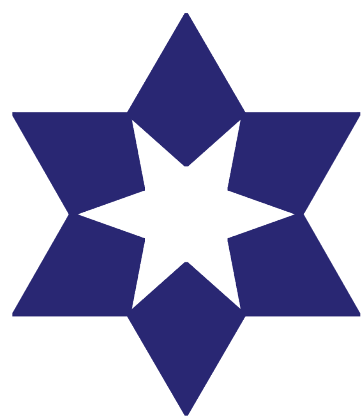

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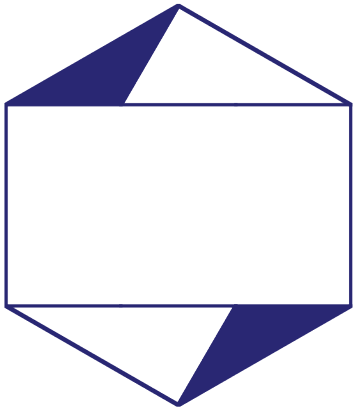

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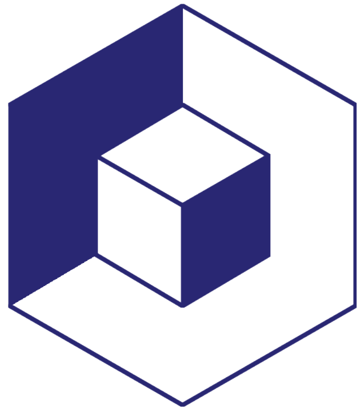

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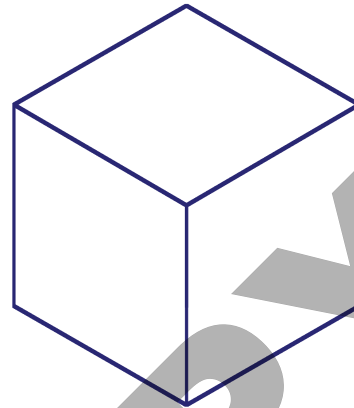

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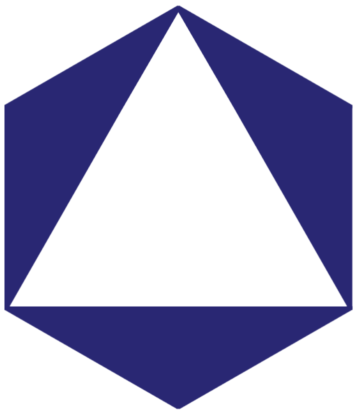

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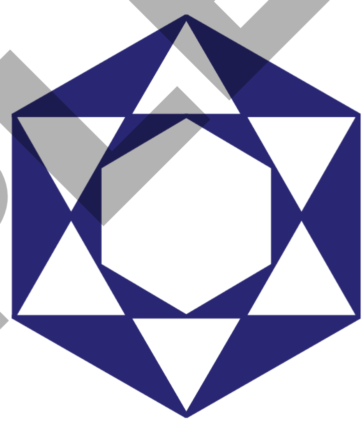

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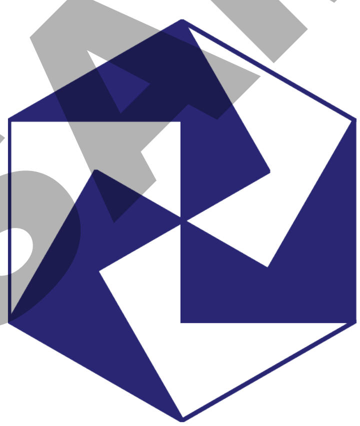

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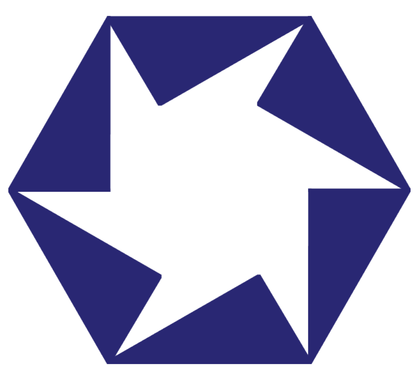

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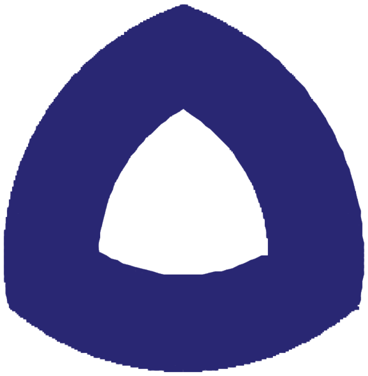

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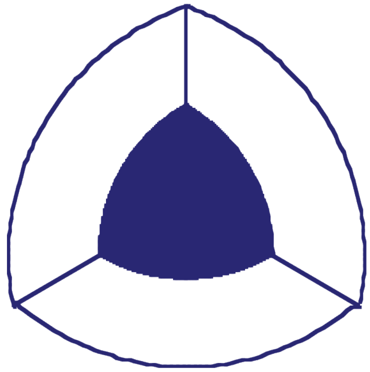

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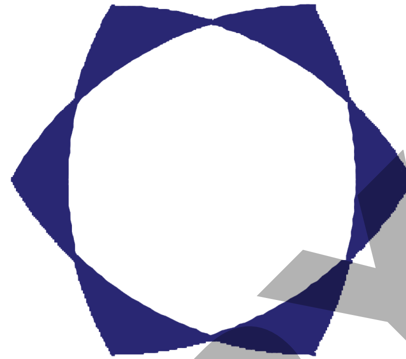

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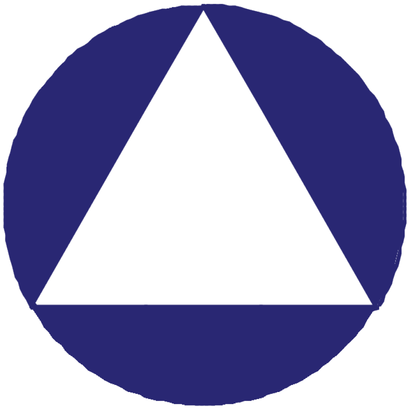

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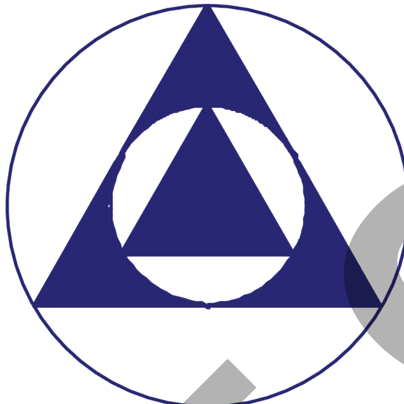

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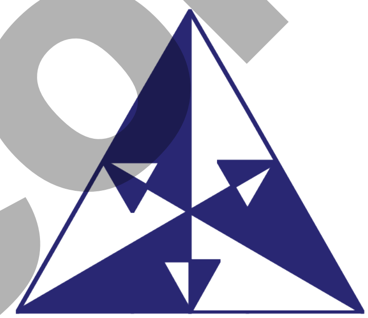

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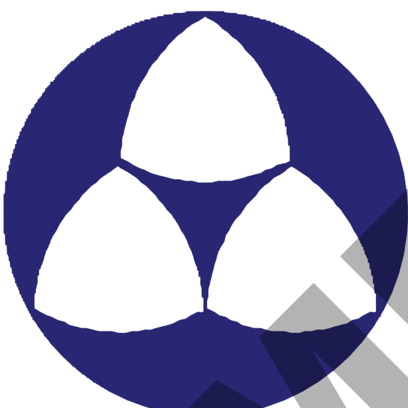

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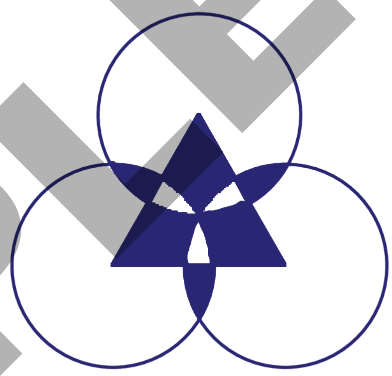

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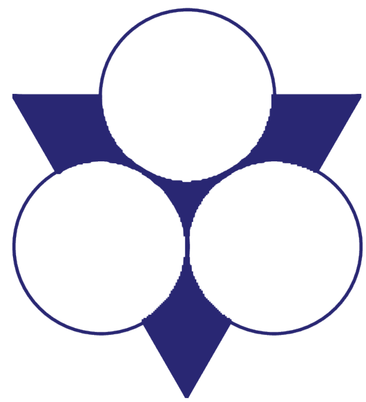

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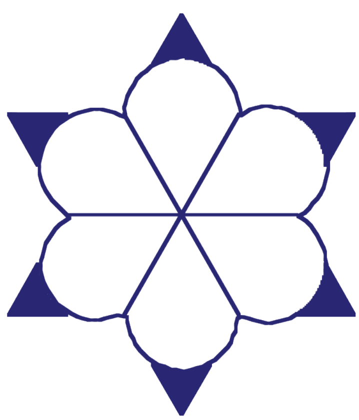

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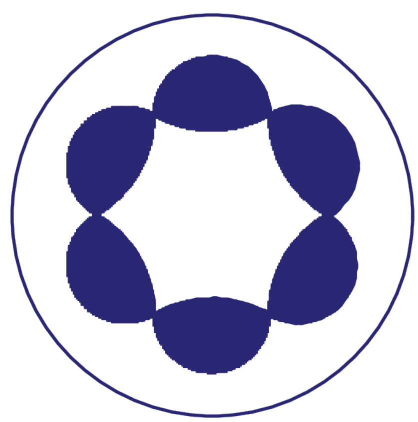

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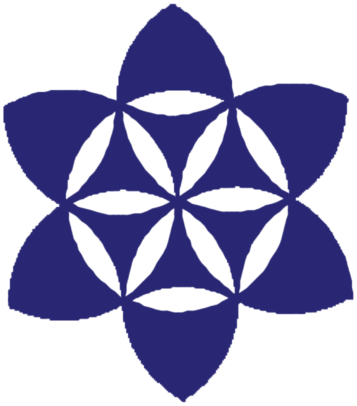
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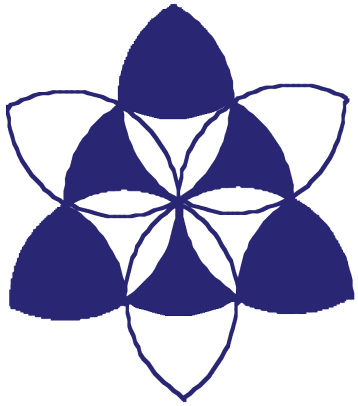
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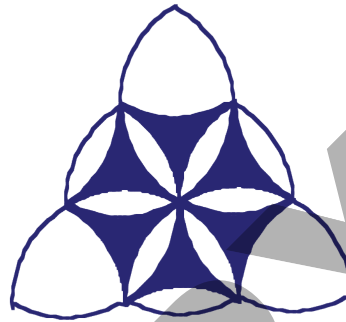
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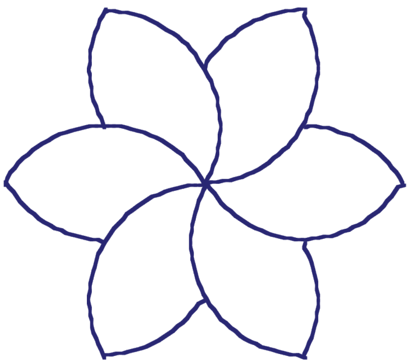
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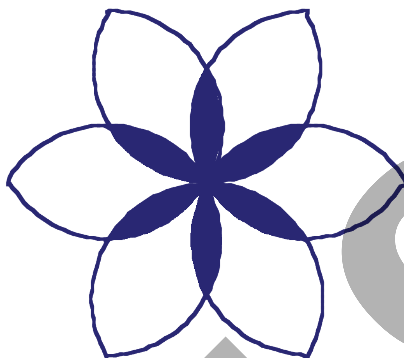
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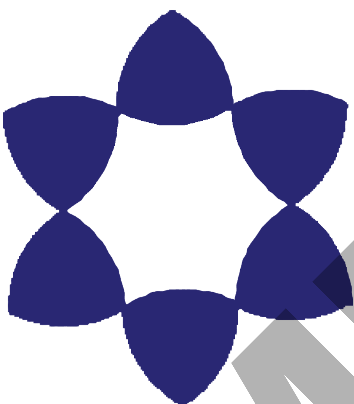
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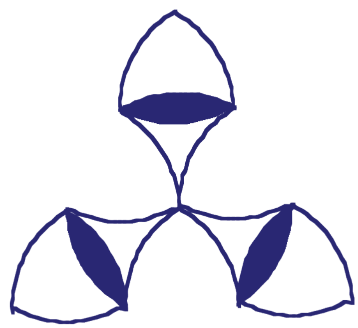
44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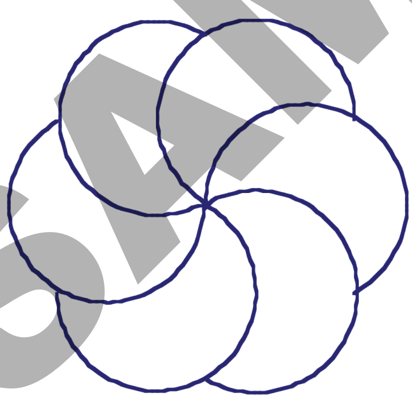
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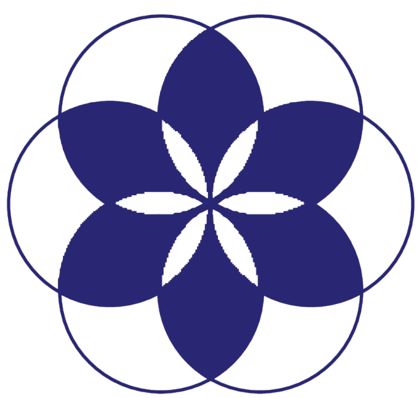
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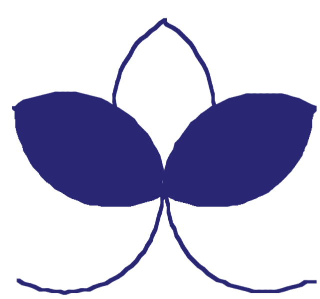

48

INTEGRATED MATH 1

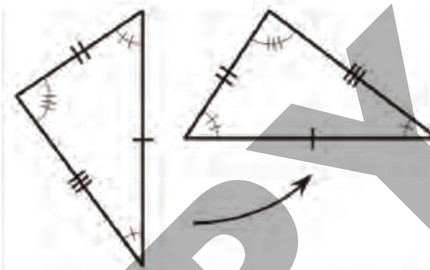
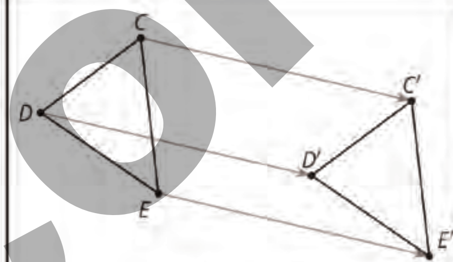
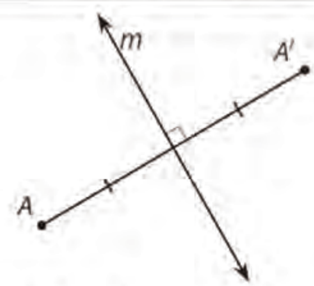
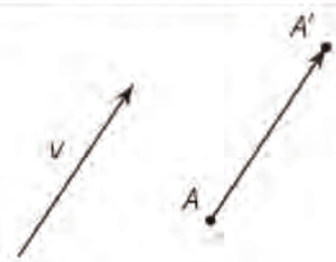
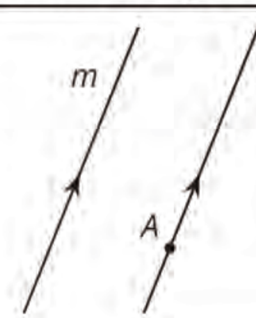
UNIT

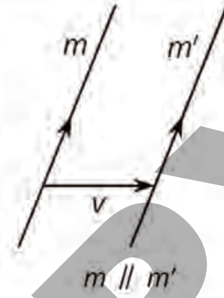
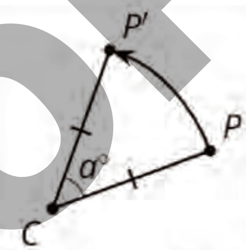
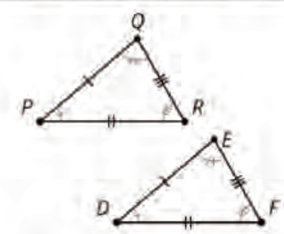
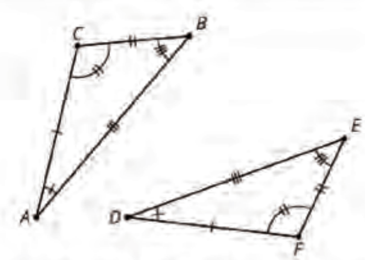
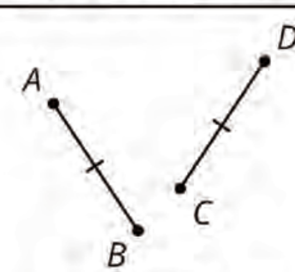
# 2

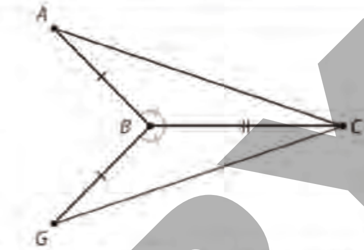
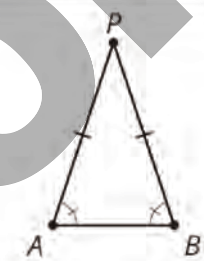
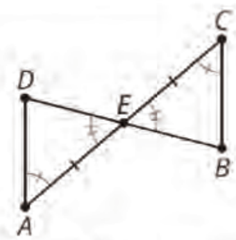
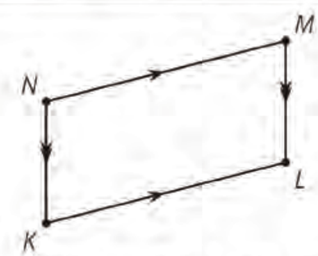
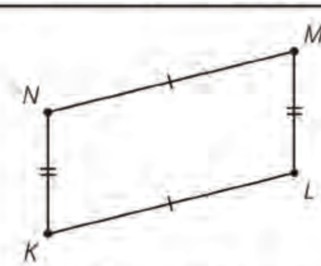
## Teacher Resource Copy Masters

LESSON BLACKLINE MASTERS

| date, type | statement | diagram |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

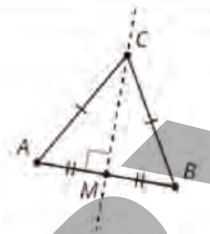
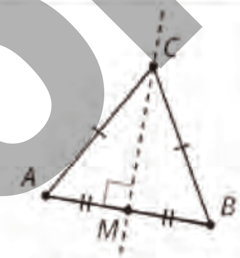
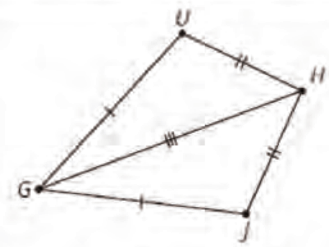
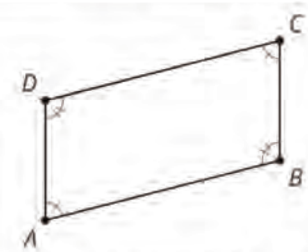
| lesson, type | statement | diagram |
|---|---|---|
| U1, L10<br>(students write the date)<br>assertion | A **rigid transformation** is a translation, reflection, rotation, or any sequence of the three.<br>Rigid transformations take lines to lines, angles to angles of the same measure, and segments to segments of the same length. |  |
| U1, L10<br>definition | Two figures are **congruent** if there is a sequence of translations, rotations, and reflections that takes one figure exactly onto the other.<br>The second figure is called the image of the rigid transformation. |  <br>$\triangle EDC \cong \triangle E'D'C'$ |
| U1, L11<br>definition | **Reflection** is a rigid transformation that takes a point to another point that is the same distance from the given line, that is on the other side of the given line, and so that the segment from the original point to the image is perpendicular to the given line.<br>"Reflect <u>(object)</u> across line <u>(name)</u>." |  <br>Reflect *A* across line *m*. |
| U1, L12<br>definition | **Translation** is a rigid transformation that takes a point to another point so that the directed line segment from the original point to the image is parallel to the given line segment and has the same length and direction.<br>"Translate <u>(object)</u> by the directed line segment <u>(name or from [point] to [point])</u>." |  <br>Translate *A* by the directed line segment *v*. |
| U1, L12<br>assertion | **Parallel Postulate:** Given a line *m* and a point *A* that is not on *m*, there is exactly one line that goes through *A* that is parallel to *m*. |   |

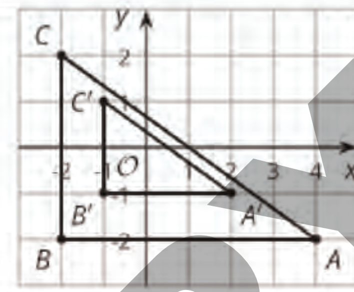
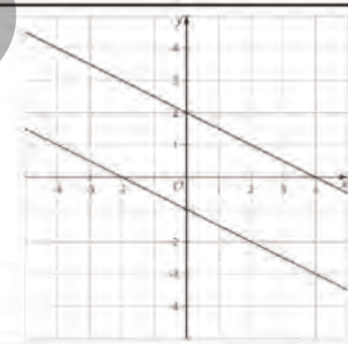
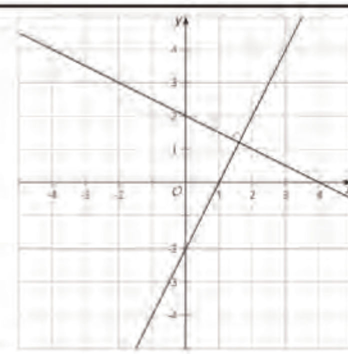
| lesson, type | statement | diagram |
|---|---|---|
| U1, L12<br>theorem | Translations take lines to parallel lines or to themselves. |  |
| U1, L14<br>definition | **Rotation** is a rigid transformation that takes a point to another point on the circle through the original point with the given center. The two radii, the one from the center to the original point and the one from the center to the image, make the given angle.<br>"Rotate _(object)_ (clockwise or counterclockwise) by _(angle or angle measure)_ using center _(point)_." | Rotate *P* counterclockwise by *a*° using center *C*. |
| U2, L1<br>theorem | If two figures are congruent, then **corresponding** parts of those figures must be congruent | $\triangle DEF \cong \triangle PQR$ so $\overline{PQ} \cong \overline{DE}$, $\overline{PR} \cong \overline{DF}$, $\overline{QR} \cong \overline{EF}$, $\angle P \cong \angle D$, $\angle Q \cong \angle E$, $\angle R \cong \angle F$ |
| U2, L3<br>theorem | If all pairs of corresponding sides and all pairs of corresponding angles are congruent, then the triangles must be congruent. | $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, $\overline{AC} \cong \overline{DF}$, $\angle A \cong \angle D$, $\angle B \cong \angle E$, $\angle C \cong \angle F$ so $\triangle ABC \cong \triangle DEF$ |
| U2, L5<br>theorem | If two segments have the same length, then they are congruent. | $AB=CD$, so $\overline{AB} \cong \overline{CD}$ |

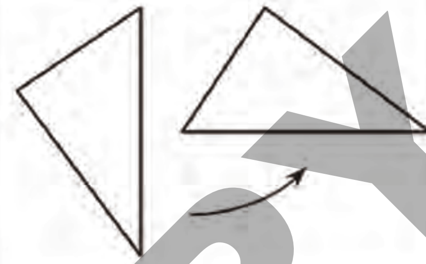
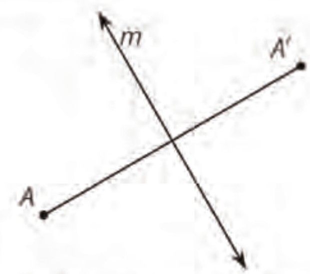
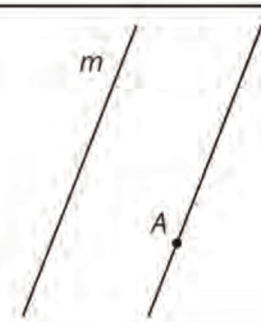
| lesson, type | statement | diagram |
|---|---|---|
| U2, L6<br>theorem | **Side-Angle-Side Triangle Congruence Theorem:** In two triangles, if two pairs of congruent corresponding sides and the pair of corresponding angles between the sides are congruent, then the two triangles are congruent. |  <br>$\overline{AB} \cong \overline{GB}$, $\overline{BC} \cong \overline{BC}$, $\angle ABC \cong \angle GBC$ so $\triangle ABC \cong \triangle GBC$ |
| U2, L6<br>theorem | **Isosceles Triangle Theorem:** In an isosceles triangle, the base angles are congruent. |  <br>$\overline{AP} \cong \overline{PB}$, so $\angle A \cong \angle B$ |
| U2, L7<br>theorem | **Angle-Side-Angle Triangle Congruence Theorem:** In two triangles, if two pairs of corresponding angles are congruent and the pair of corresponding sides between the angles is congruent, then the triangles must be congruent. |  <br>$\angle A \cong \angle C$, $\overline{AE} \cong \overline{EC}$, $\angle DEA \cong \angle BEC$, so $\triangle DEA \cong \triangle BEC$ |
| U2, L7<br>definition | A **parallelogram** is a quadrilateral with two pairs of opposite sides parallel. |  <br>*NM* // *KL*, *NK* // *ML*, so *MNKL* is a parallelogram |
| U2, L7<br>theorem | In a parallelogram, pairs of opposite sides are congruent. |  <br>*MNKL* is a parallelogram, so $\overline{NM} \cong \overline{KL}$, $\overline{NK} \cong \overline{ML}$ |

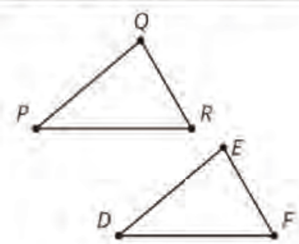
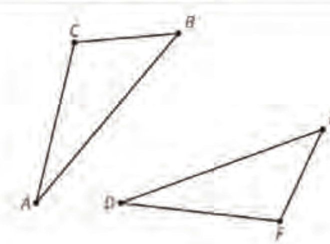
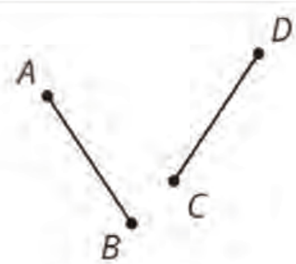


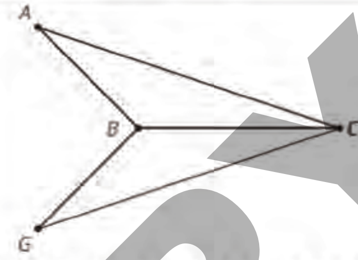
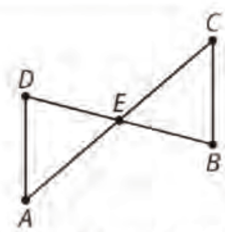
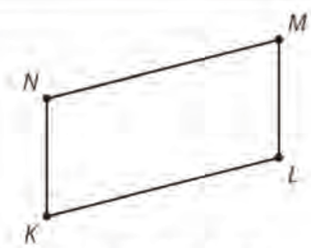
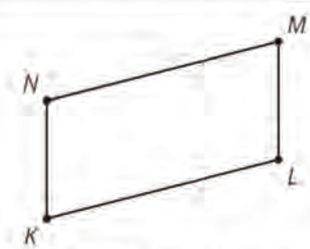
 

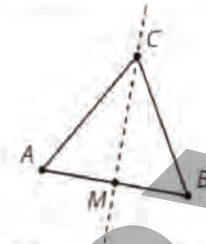
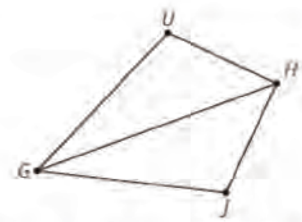
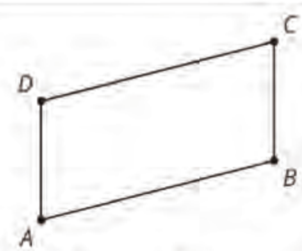
| lesson, type | statement | diagram |
|---|---|---|
| U2, L8<br>theorem | If a point *C* is the same distance from *A* as it is from *B*, then *C* must be on the perpendicular bisector of *AB*. | <br>$\overline{AC} \cong \overline{BC}$, so *C* is on the line through midpoint *M* perpendicular to $\overline{AB}$. |
| U2, L8<br>theorem | If *C* is a point on the perpendicular bisector of *AB*, the distance from *C* to *A* is the same as the distance from *C* to *B*. | <br>$AB \perp CM$, $\overline{AM} \cong \overline{BM}$, so $\overline{AC} \cong \overline{BC}$ |
| U2, L9<br>theorem | **Side-Side-Side Triangle Congruence Theorem:** In two triangles, if all three pairs of corresponding sides are congruent, then the triangles must be congruent. | <br>$\overline{HU} \cong \overline{HJ}$, $\overline{UG} \cong \overline{JG}$, $\overline{HG} \cong \overline{HG}$, so $\triangle HUG \cong \triangle HJG$ |
| U2, L9<br>theorem | In a parallelogram, opposite angles are congruent. | <br>*ABCD* is a parallelogram, so $\angle A \cong \angle C$, $\angle D \cong \angle B$ |

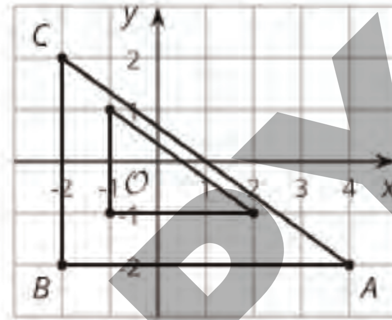
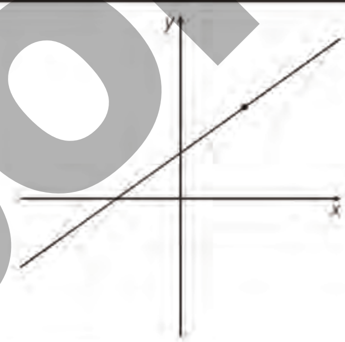
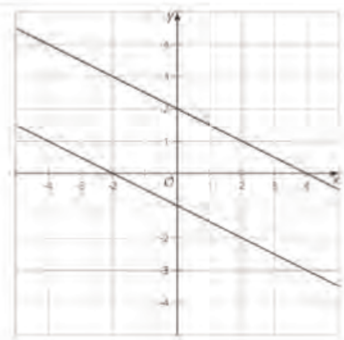
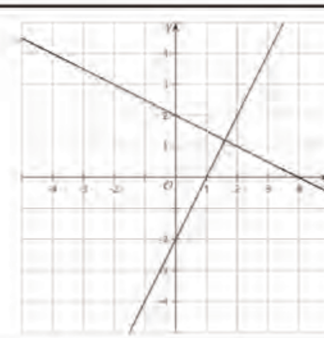
| lesson, type | statement | diagram |
|---|---|---|
| U5, L2 definition | A **dilation** is a transformation in which each point on a figure moves along a line and changes its distance from a fixed point, called the "center of dilation." All of the original distances are multiplied by the same scale factor. |  |
| U5, L4 definition | The **point-slope form** of the equation of a line is *y* – *k* = *m* (*x* – *h*) where (*h*, *k*) is a particular point on the line and *m* is the slope of the line. |  |
| U5, L5 theorem | Lines are parallel if and only if they have equal slopes. |  |
| U5, L6 theorem | Lines are perpendicular if and only if their slopes are opposite reciprocals. |  |

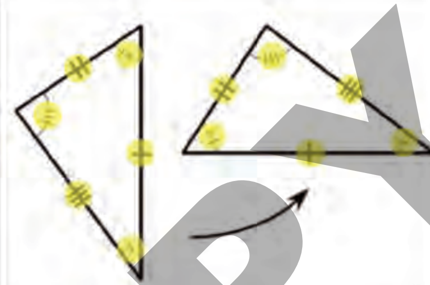
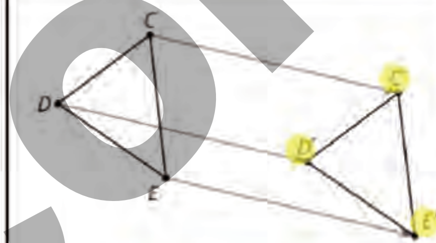
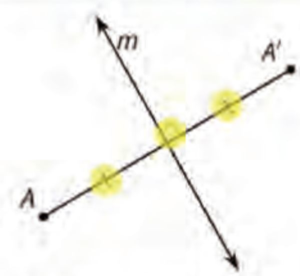
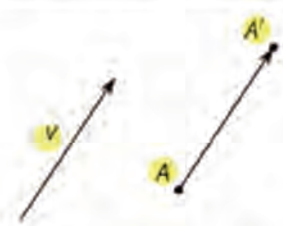
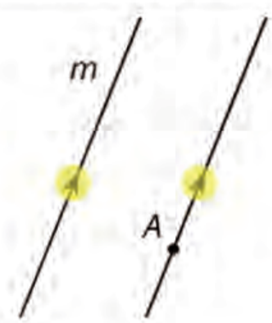
| date, type | statement | diagram |
|---|---|---|
| assertion | A ____________ is a ____________, ____________, ____________, or any sequence of the three.<br>Rigid transformations take lines to ____________, angles to ____________ of the same measure, and segments to ____________ of the same length. |  |
| definition | One figure is ____________ to another if there is a sequence of ____________, ____________, and ____________ that takes the first figure ____________ onto the second figure.<br>The second figure is called the ____________ of the rigid transformation. |  |
| definition | ____________ is a rigid transformation that takes a point to another point that is the same ____________ from the given line, on the other side of the given line, and so that the segment from the original point to the image is ____________ to the given line.<br>"Reflect _(object)_ across line _(name)_." | Reflect *A* across line *m*. |
| definition | ____________ is a rigid transformation that takes a point to another point so that the directed ____________ from the original point to the image is ____________ to the given line segment and has the same ____________ and ____________.<br>"Translate _(object)_ by the directed line segment _(name or from [point] to [point])_." | Translate *A* by the directed line segment *v*. |
| assertion | **Parallel Postulate:**<br>Given a ____________ *m* and a ____________ *A* that is not on ____, there is exactly ____________ that goes through *A* that is ____________ to *m*. |  |

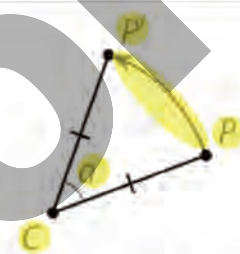
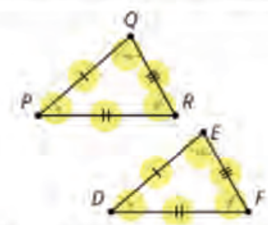
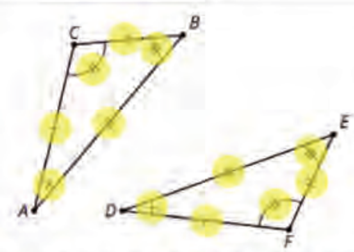
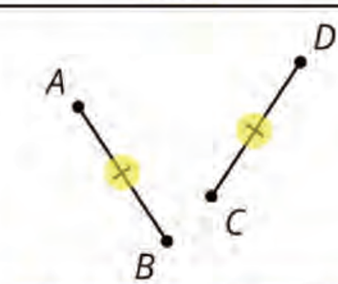
| date, type | statement | diagram |
|---|---|---|
| theorem | _____________ take lines to _________________________ or to _____________. |  |
| definition | _____________ is a _____________ transformation that takes a point to another point on the circle through the original point with the given _____________. The two radii to the original point and the image make the given _____________.<br>"Rotate _(object)_ (clockwise or counterclockwise) by _(angle or angle measure)_ using center _(point)_." | <br>Rotate *P* counterclockwise by *a*° using center *C*. |
| theorem | If two figures are _____________, then _____________ parts of those figures must be _____________. | <br>$\triangle PQR \cong \triangle DEF$ so $PQ=DE$, $PR=DF$, $QR=EF$, $\angle P \cong \angle D$, $\angle Q \cong \angle E$, $\angle R \cong \angle F$ |
| theorem | If all pairs of corresponding _____________ and all pairs of corresponding _____________ are congruent, then the _____________ must be _____________. | <br>$AB=DE$, $BC=EF$, $CA=FD$, $\angle B \cong \angle E$, $\angle A \cong \angle D$, $\angle C \cong \angle F$ so |
| theorem | If two _____________ have the same _____________, then they are _____________. |  |

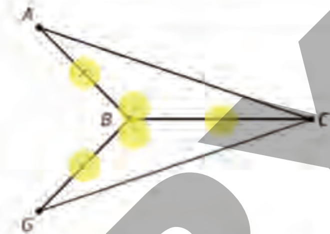
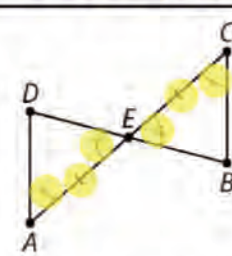
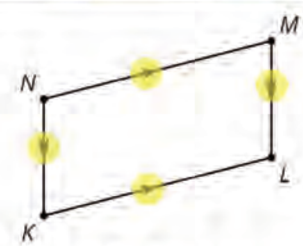
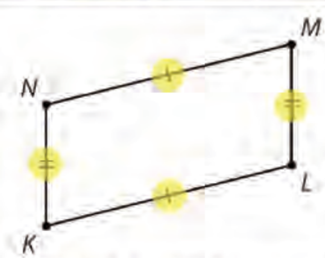
| date, type | statement | diagram |
|---|---|---|
| theorem | ____________ **Triangle Congruence Theorem:** In two triangles, if two pairs of congruent ____________ and the pair of corresponding ____________ between the sides are ____________, then the two triangles are ____________. | <br>*AB*=*GB*, *BC*=*BC*, ∠*ABC*≅∠*GBC* so |
| theorem | ____________ **Triangle Theorem:** In an ____________ triangle, the ____________ are ____________. |  |
| theorem | ____________ **Triangle Congruence Theorem:** In two triangles, if two pairs of corresponding ____________, and the pair of corresponding ____________ between the angles are ____________, then the triangles must be ____________. | <br>∠*A*≅∠*C*, *AE*=*EC*, ∠*DEA*≅∠*BEC*, so |
| definition | A ____________ is a quadrilateral with two pairs of ____________ sides ____________. | <br>*NM* ∥ *KL*, *NK* ∥ *ML*, so |
| theorem | In a ____________, pairs of ____________ sides are ____________. | <br>*MNKL* is a parallelogram, so |

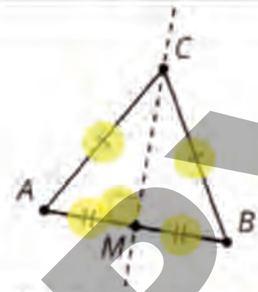
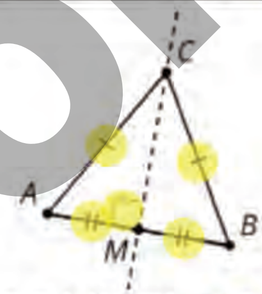
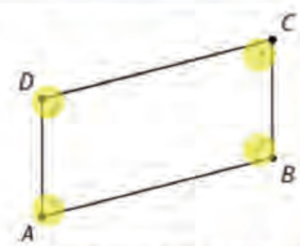
| date, type | statement | diagram |
|---|---|---|
| theorem | If a _____________ *C* is the same _____________ from _____ as it is from _____, then *C* must be on the ___________________________ of *AB*. |   *AC*=*BC*, *M* is the midpoint, so |
| theorem | If *C* is a point on the __________________________ of segment *AB*, the distance from _____ to _____ is the same as the _____________ from _____ to _____. |   *AB*⊥*CM*, *AM*=*BM*, so |
| theorem | ________________________________________ **Triangle Congruence Theorem:** In two triangles, if __________________________ of corresponding _____________ are congruent, then the triangles must be _____________. |   *HU*=*HJ*, *UG*=*JG*, *HG*=*HG* so |
| theorem | In a _____________, _____________ angles are _____________. |   *ABCD* is a parallelogram, so |

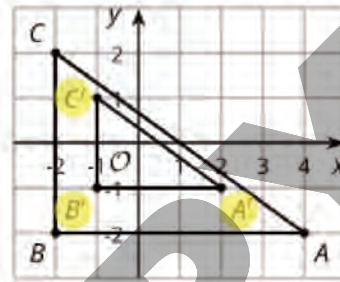
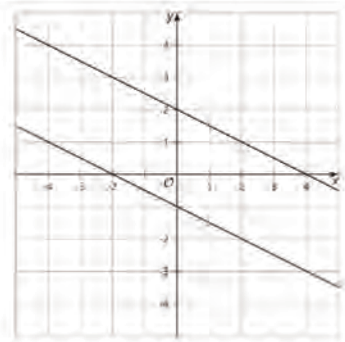
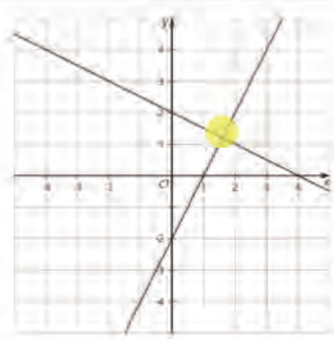
| **date, type** | **statement** | **diagram** |
|---|---|---|
| definition | A __________ is a transformation in which each point on a figure moves along a line and changes its distance from a fixed point, called the "______________." All of the original distances are multiplied by the same ____________. |  |
| definition | The _________________________ form of the equation of a line is _________________________ where $(h, k)$ is a particular ____________ on the line and $m$ is the ____________ of the line. |  |
| theorem | Lines are ____________ if and only if they have _________________________. |  |
| theorem | Lines are ____________ if and only if their ____________ are _________________________. |  |

| lesson, type | statement | diagram |
|---|---|---|
| U1, L10<br><br>(students write the date)<br><br>assertion | A **rigid transformation** is a translation, reflection, rotation, or any sequence of the three.<br><br>Rigid transformations take lines to lines, angles to angles of the same measure, and segments to segments of the same length. |  |
| U1, L10<br><br>definition | One figure is **congruent** to another if there is a sequence of translations, rotations, and reflections that takes the first figure exactly onto the second figure.<br><br>The second figure is called the image of the rigid transformation. | <br>$\triangle EDC \cong \triangle E'D'C'$ |
| U1, L11<br><br>definition | **Reflection** is a rigid transformation that takes a point to another point that is the same distance from the given line, is on the other side of the given line, and so that the segment from the original point to the image is perpendicular to the given line.<br><br>"Reflect _(object)_ across line _(name)_." | <br>Reflect *A* across line *m*. |
| U1, L12<br><br>definition | **Translation** is a rigid transformation that takes a point to another point so that the directed line segment from the original point to the image is parallel to the given line segment and has the same length and direction.<br>"Translate _(object)_ by the directed line segment _(name or from [point] to [point])_." | <br>Translate *A* by the directed line segment *v*. |
| U1, L12<br><br>assertion | **Parallel Postulate:** Given a line *m* and a point *A* that is not on *m*, there is exactly one line that goes through *A* that is parallel to *m*. |  |

| lesson, type | statement | diagram |
|---|---|---|
| U1, L12<br>theorem | Translations take lines to parallel lines or to themselves. |  |
| U1, L14<br>definition | **Rotation** is a rigid transformation that takes a point to another point on the circle through the original point with the given center. The two radii to the original point and the image make the given angle.<br>"Rotate _(object)_ (clockwise or counterclockwise) by _(angle or angle measure)_ using center _(point)_." | <br>Rotate *P* counterclockwise by $a°$ using center *C*. |
| U2, L1<br>theorem | If two figures are congruent, then **corresponding** parts of those figures must be congruent | <br>$\triangle PQR \cong \triangle DEF$ so $PQ=DE$, $PR=DF$, $QR=EF$, $\angle P \cong \angle D$, $\angle Q \cong \angle E$, $\angle R \cong \angle F$ |
| U2, L3<br>theorem | If all pairs of corresponding sides and all pairs of corresponding angles are congruent, then the triangles must be congruent. | <br>$AB=DE$, $BC=EF$, $CA=FD$, $\angle B \cong \angle E$, $\angle A \cong \angle D$, $\angle C \cong \angle F$ so $\triangle ABC \cong \triangle DEF$ |
| U2, L5<br>theorem | If two segments have the same length, then they are congruent. | <br>$AB = CD$ so, $\overline{AB} \cong \overline{CD}$ |

| lesson, type | statement | diagram |
|---|---|---|
| U2, L6<br><br>theorem | **Side-Angle-Side Triangle Congruence Theorem:** In two triangles, if two pairs of congruent corresponding sides and the pair of corresponding angles between the sides are congruent, then the two triangles are congruent. | <br>*AB*=*GB*, *BC*=*BC*, ∠*ABC*≅∠*GBC* so $\triangle ABC \cong \triangle GBC$ |
| U2, L6<br><br>theorem | **Isosceles Triangle Theorem:** In an isosceles triangle, the base angles are congruent. | <br>*AP*=*PB* so ∠*A*≅∠*B* |
| U2, L7<br><br>theorem | **Angle-Side-Angle Triangle Congruence Theorem:** In two triangles, if two pairs of corresponding angles, and the pair of corresponding sides between the angles are congruent, then the triangles must be congruent. | <br>∠*A*≅∠*C*, *AE*=*EC*, ∠*DEA*≅∠*BEC*, so $\triangle DEA \cong \triangle BEC$ |
| U2, L7<br><br>definition | A **parallelogram** is a quadrilateral with two pairs of opposite sides parallel. | <br>*NM* // *KL*, *NK* // *ML*, so *MNKL* is a parallelogram |
| U2, L7<br><br>theorem | In a parallelogram, pairs of opposite sides are congruent. | <br>*MNKL* is a parallelogram, so *NM*=*KL*, *NK*=*ML* |

| lesson, type | statement | diagram |
|---|---|---|
| U2, L8<br>theorem | If a point *C* is the same distance from *A* as it is from *B*, then *C* must be on the perpendicular bisector of *AB*. | <br>*AC*=*BC*, *M* is the midpoint, so *MC*⊥*AB* |
| U2, L8<br>theorem | If *C* is a point on the perpendicular bisector of segment *AB*, the distance from *C* to *A* is the same as the distance from *C* to *B*. | <br>*AB*⊥*CM*, *AM*=*BM*, so *AC*=*BC* |
| U2, L9<br>theorem | **Side-Side-Side Triangle Congruence Theorem:** In two triangles, if all three pairs of corresponding sides are congruent, then the triangles must be congruent. | <br>*HU*=*HJ*, *UG*=*JG*, *HG*=*HG* so $\triangle HUG \cong \triangle HJG$ |
| U2, L9<br>theorem | In a parallelogram, opposite angles are congruent. | <br>*ABCD* is a parallelogram, so ∠*A*≅∠*C*, ∠*D*≅∠*B* |

| lesson, type | statement | diagram |
|---|---|---|
| U5, L2 definition | A **dilation** is a transformation in which each point on a figure moves along a line and changes its distance from a fixed point, called the "center of dilation." All of the original distances are multiplied by the same scale factor. |   |
| U5, L4 definition | The **point-slope form** of the equation of a line is *y* – *k* = *m* (*x* – *h*) where (*h*, *k*) is a particular point on the line and *m* is the slope of the line. |   |
| U5, L5 theorem | Lines are parallel if and only if they have equal slopes. |  |
| U5, L6 theorem | Lines are perpendicular if and only if their slopes are opposite reciprocals. |  |

Invisible Triangles

## Transformer

Listen to hear which parts of the triangles correspond. Then give instructions to take one triangle onto the other.

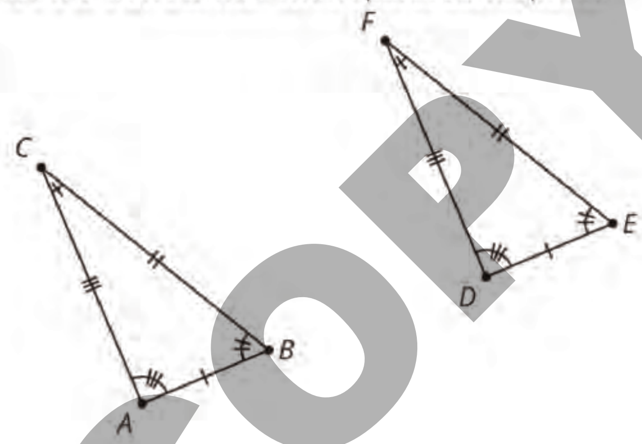
Possible instructions:

- Translate ______ from ______ to ______.
- Rotate ______ using ______ as the center by angle ______.
- Rotate using ______ as the center so that ______ coincides with ______.
- Reflect ______ across ______.
- Reflect ______ across the perpendicular bisector of ______.

Invisible Triangles

## Card A

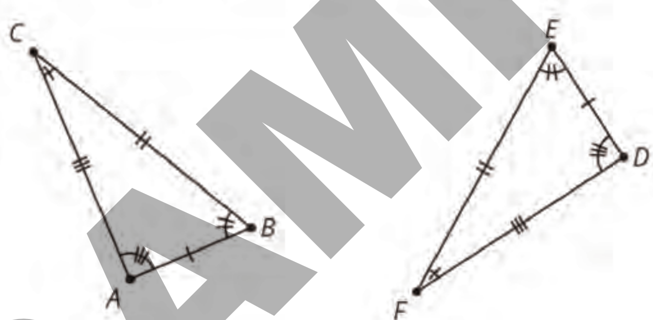
Tell the transformer which parts correspond.




Invisible Triangles

## Card B

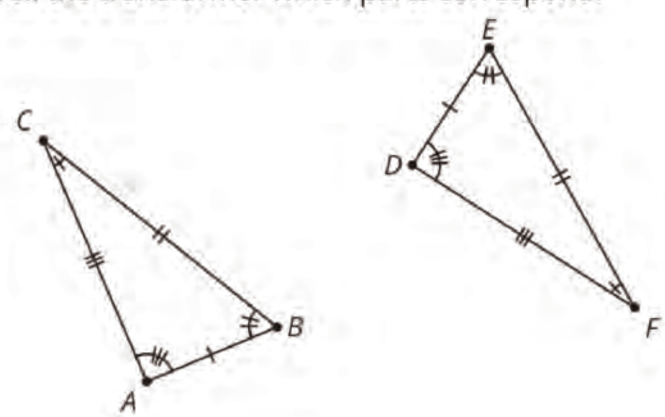
Tell the transformer which parts correspond.




Invisible Triangles

## Card C

Tell the transformer which parts correspond.



# Proving the Triangle Congruence Theorems
# Sentence Frames for Proofs

**Transformations:**

- Translate ______ from ______ to ______.
- Rotate ______ using ______ as the center by angle ______.
- Rotate ______ using ______ as the center so that ______ coincides with ______.
- Reflect ______ across ______.
- Reflect ______ across the perpendicular bisector of ______.
- Segments ______ and ______ are the same length so they are congruent. Therefore, there is a rigid motion that takes ______ to ______. Apply that rigid motion to ______.

**Justifications:**

- We know the image of ______ is congruent to ______ because rigid motions preserve measure.
- Points ______ and ______ coincide after translating because we defined our translation that way!
- Since points ______ and ______ are the same distance along the same ray from ______ they have to be in the same place.
- Rays ______ and ______ coincide after rotating because we defined our rotation that way!
- The image of ______ must be on ray ______ since both ______ and ______ are on the same side of ______ and make the same angle with it at ______.
- Points ______ and ______ coincide because they are both at the intersection of the same lines, and 2 distinct lines can only intersect in 1 place.
- ______ is the perpendicular bisector of the segment connecting ______ and ______, because the perpendicular bisector is determined by 2 points that are both equidistant from the endpoints of a segment.

**Conclusion statement:**

- We have shown that a rigid motion takes ______ to ______, ______ to ______, and ______ to ______, therefore triangle ______ is congruent to triangle ______.

This page includes an additional set of info gap cards to use as an optional demonstration.

Cards for the student activity are located on the following page.

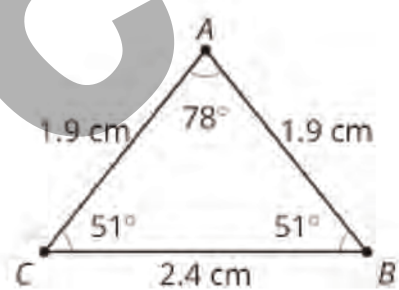
Info Gap: TMI

## Problem Card 0

Construct a triangle that is congruent to your partner's. What is the least amount of information that you need?

Info Gap: TMI

## Data Card 0



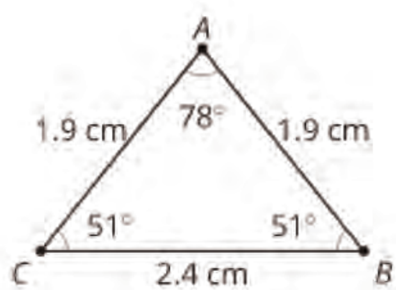

Info Gap: TMI

## Problem Card 0

Construct a triangle that is congruent to your partner's. What is the least amount of information that you need?

Info Gap: TMI

## Data Card 0



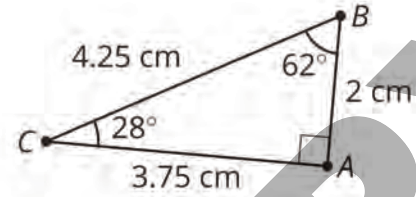
Info Gap: TMI

## Problem Card 1

Construct a triangle that is congruent to your partner's. What is the least amount of information that you need?

Info Gap: TMI

## Data Card 1



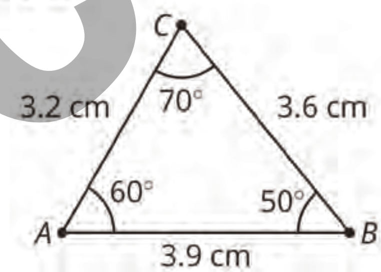

Info Gap: TMI

## Problem Card 2

Construct a triangle that is congruent to your partner's. What is the least amount of information that you need?

Info Gap: TMI

## Data Card 2



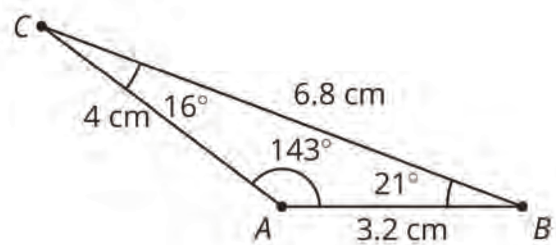

Info Gap: TMI

## Problem Card 3

Construct a triangle that is congruent to your partner's. What is the least amount of information that you need?

Info Gap: TMI

## Data Card 3



# Proving the Triangle Congruence Theorems
## Sentence Frames for Proofs

**Transformations:**

- Translate ______ from ______ to ______.
- Rotate ______ using ______ as the center by angle ______.
- Rotate ______ using ______ as the center so that ______ coincides with ______.
- Reflect ______ across ______.
- Reflect ______ across the perpendicular bisector of ______.
- Segments ______ and ______ are the same length so they are congruent. Therefore, there is a rigid motion that takes ______ to ______. Apply that rigid motion to ______.

**Justifications:**

- We know the image of ______ is congruent to ______ because rigid motions preserve measure.
- Points ______ and ______ coincide after translating because we defined our translation that way!
- Since points ______ and ______ are the same distance along the same ray from ______ they have to be in the same place.
- Rays ______ and ______ coincide after rotating because we defined our rotation that way!
- The image of ______ must be on ray ______ since both ______ and ______ are on the same side of ______ and make the same angle with it at ______.
- Points ______ and ______ coincide because they are both at the intersection of the same lines, and 2 distinct lines can only intersect in 1 place.
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- We have shown that a rigid motion takes ______ to ______, ______ to ______, and ______ to ______, therefore triangle ______ is congruent to triangle ______.

# Proving the Triangle Congruence Theorems
# Sentence Frames for Proofs

**Transformations:**

- Translate _______ from _______ to _______.
- Rotate _______ using _______ as the center by angle _______.
- Rotate _______ using _______ as the center so that _______ coincides with _______.
- Reflect _______ across _______.
- Reflect _______ across the perpendicular bisector of _______.
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- The image of _______ must be on ray _______ since both _______ and _______ are on the same side of _______ and make the same angle with it at _______.
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**Conclusion statement:**

- We have shown that a rigid motion takes _______ to _______, _______ to _______, and _______ to _______, therefore triangle _______ is congruent to triangle _______.

What Do We Know For Sure About Isosceles Triangles?

## Kiran

**Kiran**: I'm stumped on this proof.
Mai: What are you trying to prove?

**Kiran**: I'm trying to prove that in an isosceles triangle, the two base angles are congruent. So in this case, that angle $A$ is congruent to angle $B$.
Mai: Let's think of what geometry ideas we already know are true.

**Kiran**: We know if two pairs of corresponding sides, and the corresponding angles between the sides, are congruent, then the triangles must be congruent.
Mai: Yes, and we also know that we can use reflections, rotations, and translations to prove congruence and symmetry. . . The isosceles triangle you've drawn makes me think of symmetry. If you draw a line down the middle of it, I wonder if that could help us prove that the angles are the same?
[Mai draws the line of symmetry of the triangle and labels the intersection of AB and the line of symmetry Q].

**Kiran**: Wait, when you draw the line, it breaks the triangle into two smaller triangles. I wonder if I could prove those triangles are congruent using Side-Angle-Side Congruence?
Mai: It's an isosceles triangle, so we know that one pair of corresponding sides is congruent. [Mai marks the congruent sides.]

**Kiran**: And this segment in the middle here is part of both triangles, so it has to be the same length for both. Look.

[**Kiran draws** the two halves of the isosceles triangle and marks the shared sides as congruent.]
Mai: So we have two pairs of corresponding sides that are congruent. How do we know the angles between them are congruent?

**Kiran**: I'm not sure. Maybe it has to do with how we drew that line of symmetry?

What Do We Know For Sure About Isosceles Triangles?

## Mai

Kiran: I'm stumped on this proof.

**Mai**: What are you trying to prove?
Kiran: I'm trying to prove that in an isosceles triangle, the two base angles are congruent. So in this case, that angle $A$ is congruent to angle $B$.

**Mai**: Let's think of what geometry ideas we already know are true.
Kiran: We know if two pairs of corresponding sides, and the corresponding angles between the sides, are congruent, then the triangles must be congruent.

**Mai**: Yes, and we also know that we can use reflections, rotations, and translations to prove congruence and symmetry. . . The isosceles triangle you've drawn makes me think of symmetry. If you draw a line down the middle of it, I wonder if that could help us prove that the angles are the same?

[**Mai draws** the line of symmetry of the triangle and labels the intersection of AB and the line of symmetry Q.]
Kiran: Wait, when you draw the line, it breaks the triangle into two smaller triangles. I wonder if I could prove those triangles are congruent using Side-Angle-Side Congruence?

**Mai**: It's an isosceles triangle, so we know that one pair of corresponding sides is congruent. [Mai marks the congruent sides.]
Kiran: And this segment in the middle here is part of both triangles, so it has to be the same length for both. Look.
[Kiran draws the two halves of the isosceles triangle and marks the shared sides as congruent.]

**Mai**: So we have two pairs of corresponding sides that are congruent. How do we know the angles between them are congruent?
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# Proving the Triangle Congruence Theorems
## Sentence Frames for Proofs

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- Rotate ______ using ______ as the center so that ______ coincides with ______.
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- Reflect ______ across the perpendicular bisector of ______.
- Segments ______ and ______ are the same length so they are congruent. Therefore, there is a rigid motion that takes ______ to ______. Apply that rigid motion to ______.

**Justifications:**

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- We have shown that a rigid motion takes ______ to ______, ______ to ______, and ______ to ______, therefore triangle ______ is congruent to triangle ______.

**Using** the Triangle Congruence Theorems

# More Proof Supports

Many proofs in Euclidean geometry that don't use transformations use congruent triangles: if you can find two triangles that you are SURE are congruent, you can prove that any corresponding parts of your triangles are congruent.

1. Can you find any triangles that are probably congruent? Suggestion: outline them in different colors or re-draw them separately on your paper.
2. If you can't find any triangles yet, is there a helpful auxiliary line you can draw?
   a. A line of symmetry?
   b. A segment connecting two points, such as the diagonal of a quadrilateral?
3. Label all of the things you know are congruent. This will help you decide how to prove two triangles are congruent.
   a. Do you know all three pairs of corresponding sides are congruent? Use SSS Congruence!
   b. Do you know two pairs of corresponding angles are congruent? Look to see if you can show the sides between the corresponding angles are congruent to use ASA Congruence!
   c. Do you know two pairs of corresponding sides are congruent? Look to see if you can show the angles between the corresponding sides are congruent to use SAS!
4. Seems like there's not enough information? Here are some things to check:
   a. Do the triangles share a side or an angle? Sides and angles are congruent to themselves!
   b. Are any of the sides radii of the same circle? All of the radii in the same circle are congruent.
   c. Are there parallel lines? Look for angles that must be congruent when formed by parallel lines, such as alternate interior angles.
   d. Are there vertical angles?
   e. Is there a quadrilateral with special properties?

You can use this template if you want:

Goal: Prove ________________ is congruent to ________________

I'm going to do this by proving Triangle ______ is congruent to triangle _______ by ______ Congruence Theorem.

Statement 1:

Reason 1:

Statement 2:

Reason 2:

Statement 3:

Reason 3:

Therefore, Triangle ______ is congruent to triangle _______ by ______ Congruence Theorem.

Since _____ and _______ are corresponding parts of congruent triangles, _____ and ________ must be congruent.

Not Too Close, Not Too Far (Part 1)

**Narrator:** Diego, Jada, and Noah were given the following task: “Prove that if a point $C$ is the same distance from $A$ as it is from $B$, then $C$ must be on the perpendicular bisector of $AB$.” At first they were really stuck.

**Noah:** How do you prove a point is on a line?

**Narrator:** Their teacher gave them the hint, “Another way to think about it is to draw a line that you know $C$ is on, and prove that line has to be the perpendicular bisector.” They each drew a line and thought about their pictures.

**Diego:** I drew a line through $C$ that was perpendicular to $AB$ and through the midpoint of $AB$. That line is the perpendicular bisector of $AB$ and $C$ is on it, so that proves $C$ is on the perpendicular bisector.”

**Jada:** I thought the line through $C$ would probably go through the midpoint of $AB$ so I drew that and labeled the midpoint $D$. Triangle $ACB$ is isosceles, so angles $A$ and $B$ are congruent, and $AC$ and $BC$ are congruent. And $AD$ and $DB$ are congruent because $D$ is a midpoint. That made two congruent triangles by the Side-Angle-Side Triangle Congruence Theorem. So I know angle $ADC$ and angle $BDC$ are congruent, but I still don’t know if $DC$ is the perpendicular bisector of $AB$.

**Noah:** In the Isosceles Triangle Theorem proof, Mai and Kiran drew an angle bisector in their isosceles triangle, so I’ll try that. I’ll draw the angle bisector of angle $ACB$. The point where the angle bisector hits $AB$ will be $D$. So triangles $ACD$ and $BCD$ are congruent, which means $AD$ and $BD$ are congruent, so $D$ is a midpoint and $CD$ is the perpendicular bisector.

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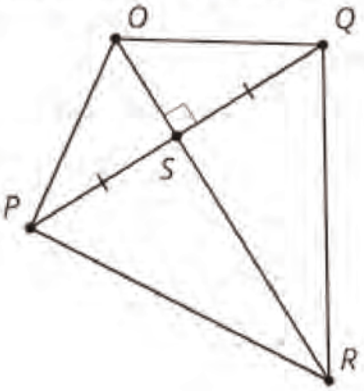
More Practice Seeing Shortcuts

## Figure *POQR*

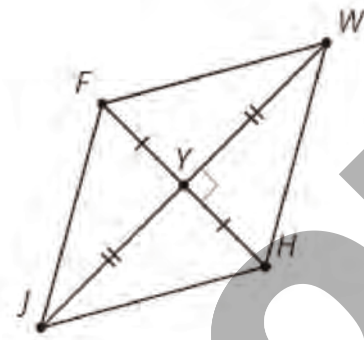
$\overline{OR} \perp \overline{PQ}, \overline{PS} \cong \overline{QS}$




More Practice Seeing Shortcuts

## Figure *FJHW*

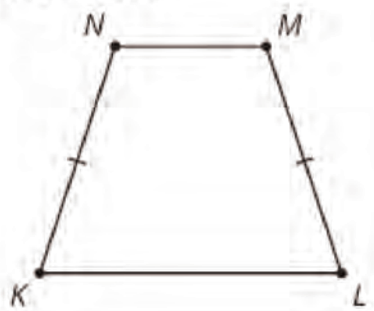
$\overline{JW} \perp \overline{FH}, \overline{FY} \cong \overline{HY}, \overline{JY} \cong \overline{WY}$




More Practice Seeing Shortcuts

## Figure *KLMN*

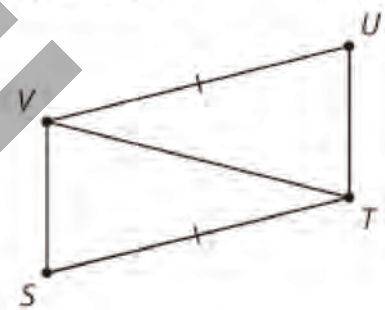
$\overline{KN} \cong \overline{LM}$




More Practice Seeing Shortcuts

## Figure *STUV*

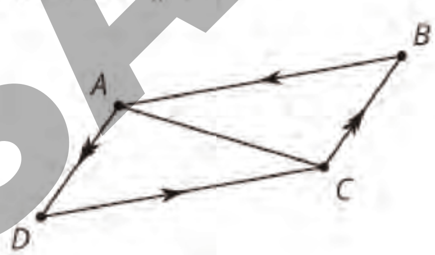
$\overline{TS} \cong \overline{VU}$




More Practice Seeing Shortcuts

## Figure *ABCD*

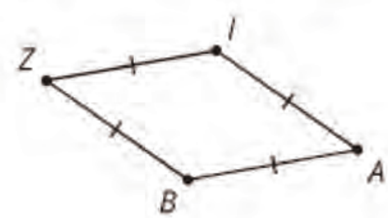
$\overline{DC} \parallel \overline{BA}, \overline{AD} \parallel \overline{CB}$




More Practice Seeing Shortcuts

## Figure *ZIAB*

$\overline{ZI} \cong \overline{IA} \cong \overline{AB} \cong \overline{BZ}$



Ambiguously Ambiguous?

## Group 1

Triangle $ABC$:
angle $A = 90°$, $AB = 16$ cm, $BC = 20$ cm

Triangle $DEF$:
angle $D = 30°$, $DE = 15$ cm, $EF = 8$ cm

Triangle $GHI$:
angle $G = 50°$, $GH = 11$ cm, $HI = 13$ cm

Ambiguously Ambiguous?

## Group 2

Triangle $JKL$:
angle $J = 90°$, $JK = 24$ cm, $KL = 26$ cm

Triangle $MNO$:
angle $M = 60°$, $MN = 17$ cm, $NO = 15$ cm

Triangle $PQR$:
angle $P = 40°$, $PQ = 15$ cm, $QR = 20$ cm

Ambiguously Ambiguous?

## Group 3

Triangle $STU$:
angle $S = 50°$, $ST = 13$ cm, $TU = 11$ cm

Triangle $VWX$:
angle $V = 45°$, $VW = 18$ cm, $WX = 14$ cm

Triangle $ABC$:
angle $A = 90°$, $AB = 16$ cm, $BC = 20$ cm

Ambiguously Ambiguous?

## Group 4

Triangle $DEF$:
angle $D = 30°$, $DE = 15$ cm, $EF = 8$ cm

Triangle $GHI$:
angle $G = 50°$, $GH = 11$ cm, $HI = 13$ cm

Triangle $JKL$:
angle $J = 90°$, $JK = 24$ cm, $KL = 26$ cm

Ambiguously Ambiguous?

## Group 5

Triangle $MNO$:
angle $M = 60°,\ MN = 17 \text{ cm},\ NO = 15 \text{ cm}$

Triangle $PQR$:
angle $P = 40°,\ PQ = 15 \text{ cm},\ QR = 20 \text{ cm}$

Triangle $STU$:
angle $S = 50°,\ ST = 13 \text{ cm},\ TU = 11 \text{ cm}$

Ambiguously Ambiguous?

## Group 6

Triangle $VWX$:
angle $V = 45°,\ VW = 18 \text{ cm},\ WX = 14 \text{ cm}$

Triangle $ABC$:
angle $A = 90°,\ AB = 16 \text{ cm},\ BC = 20 \text{ cm}$

Triangle $DEF$:
angle $D = 30°,\ DE = 15 \text{ cm},\ EF = 8 \text{ cm}$

Ambiguously Ambiguous?

## Group 7

Triangle $GHI$:
angle $G = 50°,\ GH = 11 \text{ cm},\ HI = 13 \text{ cm}$

Triangle $JKL$:
angle $J = 90°,\ JK = 24 \text{ cm},\ KL = 26 \text{ cm}$

Triangle $MNO$:
angle $M = 60°,\ MN = 17 \text{ cm},\ NO = 15 \text{ cm}$

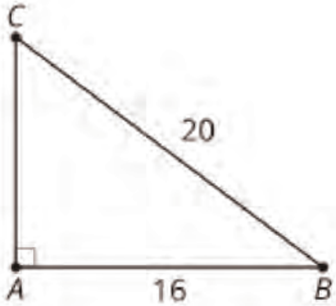
Ambiguously Ambiguous?

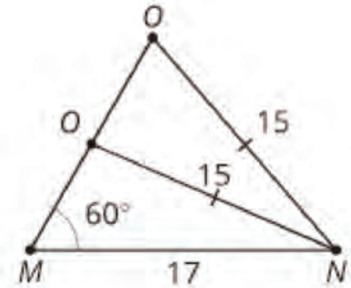
## Group 8

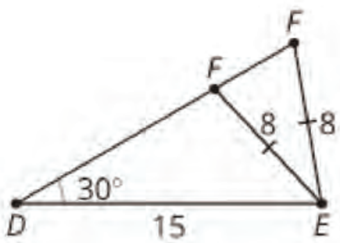
Triangle $PQR$:
angle $P = 40°,\ PQ = 15 \text{ cm},\ QR = 20 \text{ cm}$

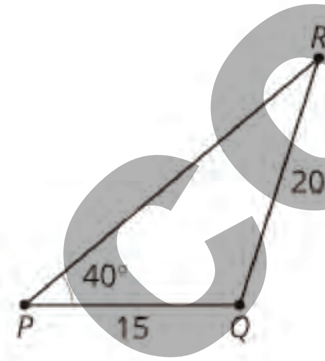
Triangle $STU$:
angle $S = 50°,\ ST = 13 \text{ cm},\ TU = 11 \text{ cm}$

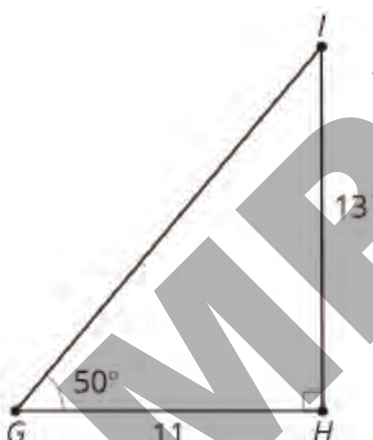
Triangle $VWX$:
angle $V = 45°,\ VW = 18 \text{ cm},\ WX = 14 \text{ cm}$

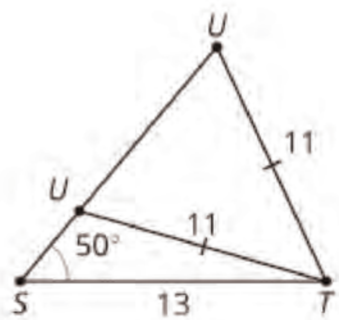

C
20
A
16
B

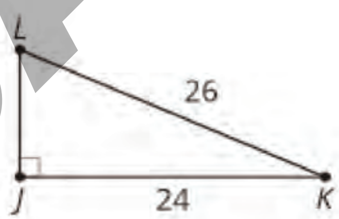

O
O
15
15
60°
M
17
N

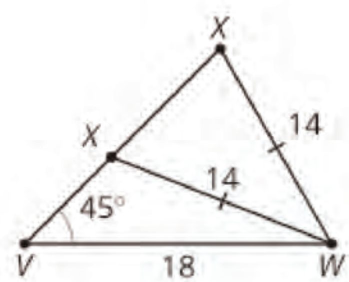

F
F
8
8
30°
D
15
E


R
20
40°
P
15
Q


I
13
50°
G
11
H


U
11
U
11
50°
S
13
T


L
26
J
24
K


X
14
X
14
45°
V
18
W

INTEGRATED MATH 1

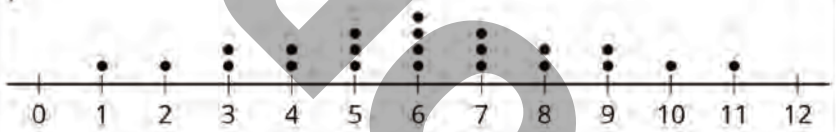
UNIT

# 3

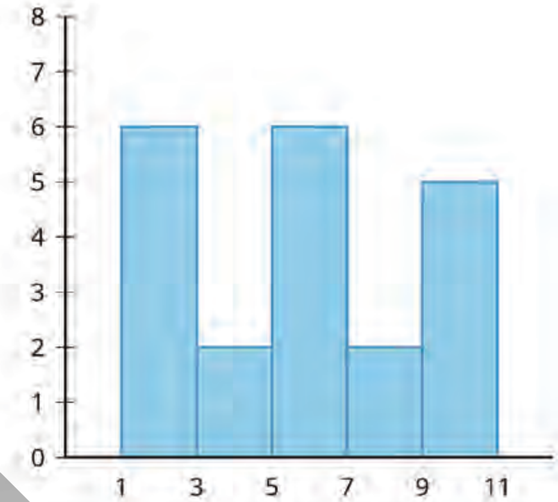
## Teacher Resource Copy Masters

## LESSON BLACKLINE MASTERS

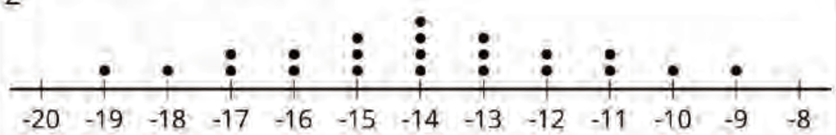
Card Sort: Matching Distributions
1



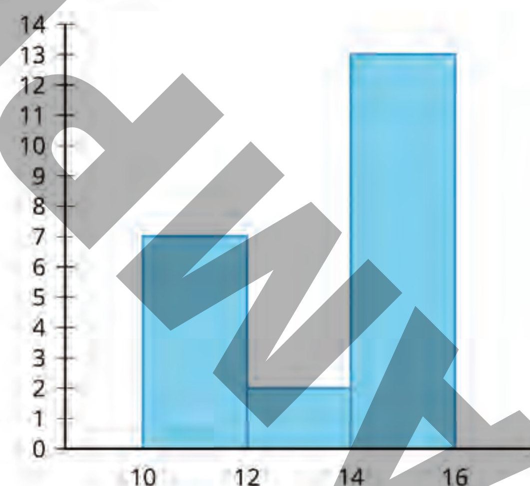

Card Sort: Matching Distributions
A




Card Sort: Matching Distributions
2




Card Sort: Matching Distributions
B

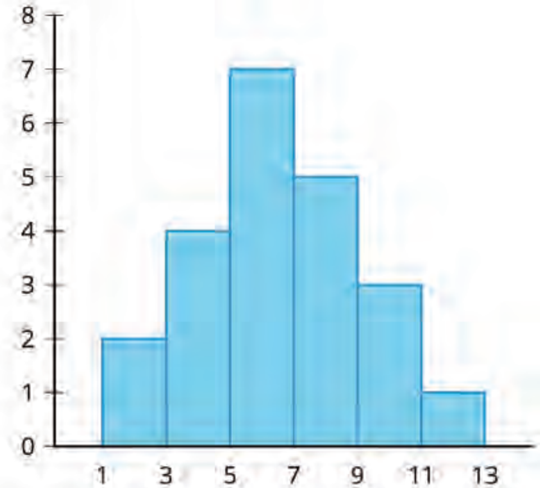


Card Sort: Matching Distributions

3

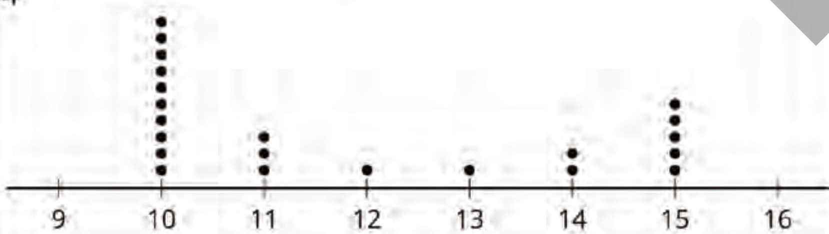

Card Sort: Matching Distributions

C



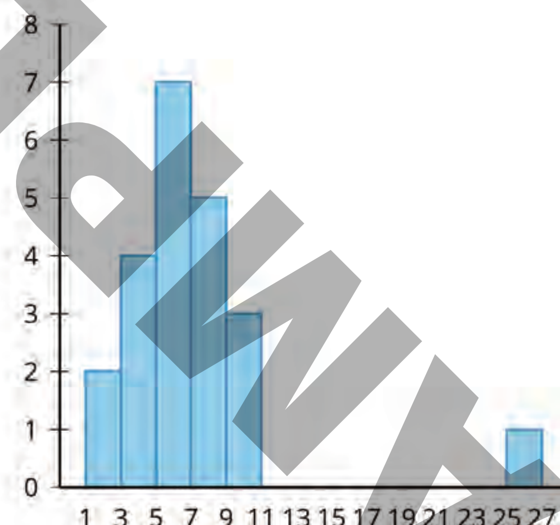

Card Sort: Matching Distributions

4



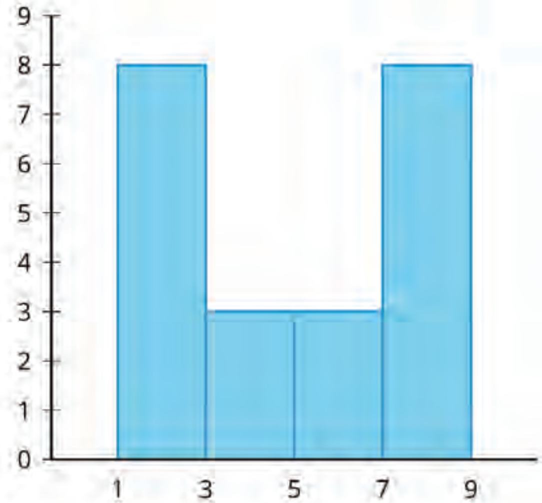

Card Sort: Matching Distributions

D

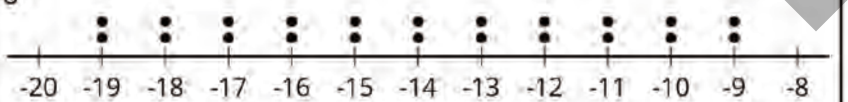


Card Sort: Matching Distributions
5

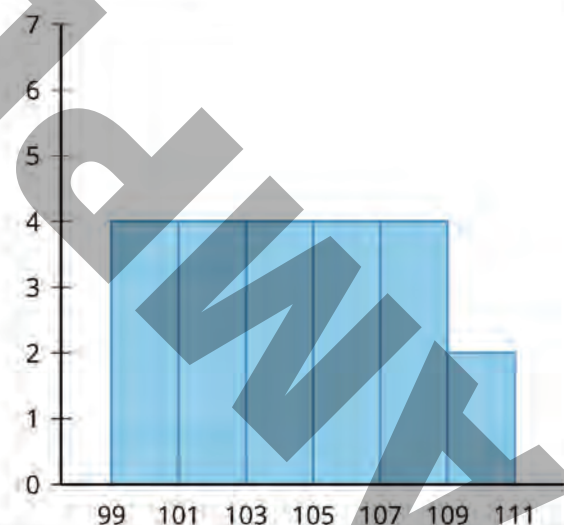

Card Sort: Matching Distributions
E




Card Sort: Matching Distributions
6



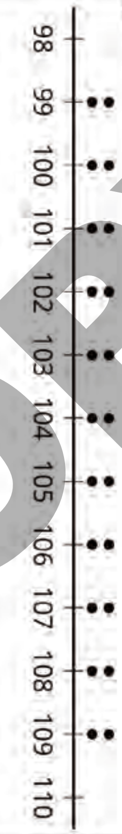

Card Sort: Matching Distributions
F





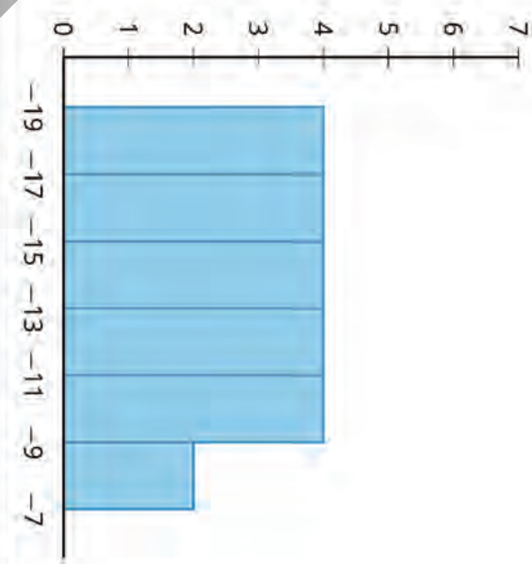

 

Card Sort: Matching Distributions
7

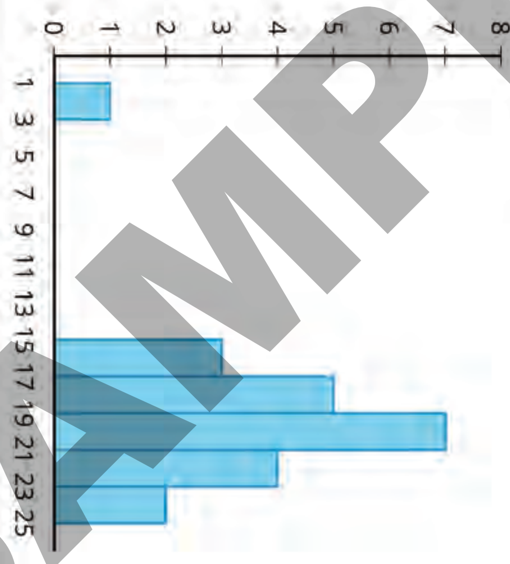



Card Sort: Matching Distributions
8


Card Sort: Matching Distributions
G

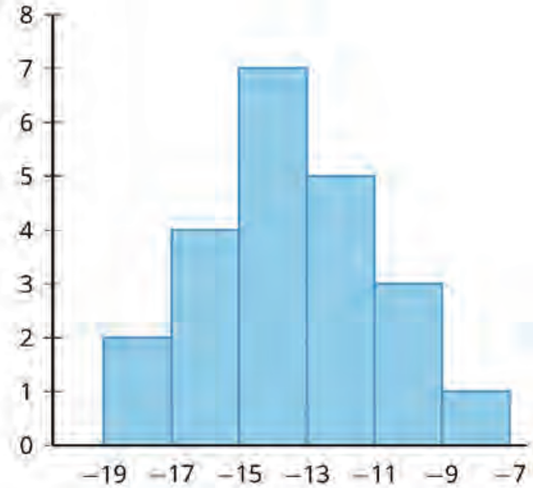



Card Sort: Matching Distributions
H



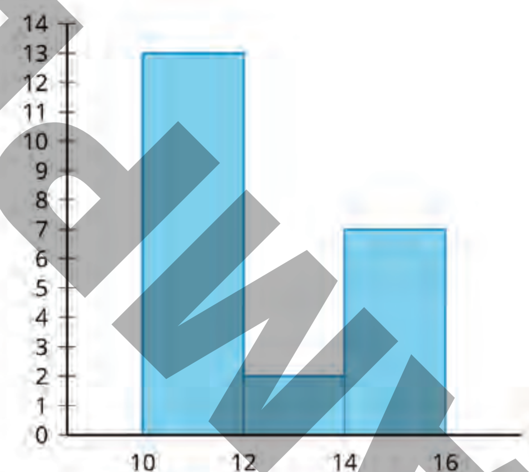
Card Sort: Matching Distributions
9


Card Sort: Matching Distributions
I




Card Sort: Matching Distributions
10


Card Sort: Matching Distributions
J



This graphic organizer might help you determine which data values are useful for determining each of the statistics.

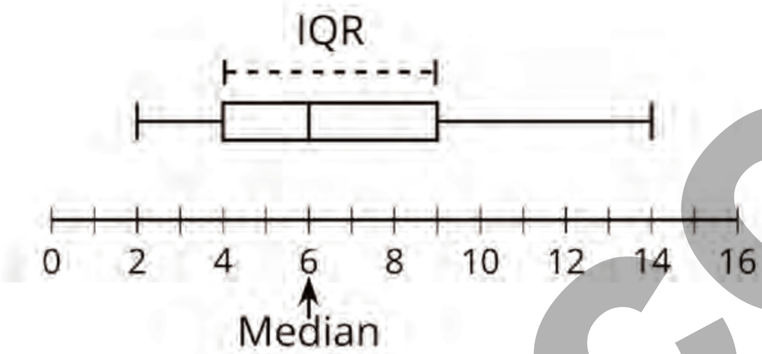
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **data values from least to greatest** | | | | | | | | |
| **median (the middle value or the average of the two middle values)** | | | | | | | | |
| **values of the first half of the data** | | | | | | | | |
| **Q1 (the median of the first half of the data)** | | | | | | | | |
| **values of the second half of the data** | | | | | | | | |
| **Q3 (the median of the second half of the data)** | | | | | | | | |

This graphic organizer might help you determine which data values are useful for determining each of the statistics.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **data values from least to greatest** | | | | | | | | |
| **median (the middle value or the average of the two middle values)** | | | | | | | | |
| **values of the first half of the data** | | | | | | | | |
| **Q1 (the median of the first half of the data)** | | | | | | | | |
| **values of the second half of the data** | | | | | | | | |
| **Q3 (the median of the second half of the data)** | | | | | | | | |

**Algebra 1 Unit 1 Useful Terms and Displays**

Median: A measure of center that divides the data so that the number of values less than or equal to the median is the same as the number of values that are greater than or equal to the median. Medians are easiest to see in a box plot.

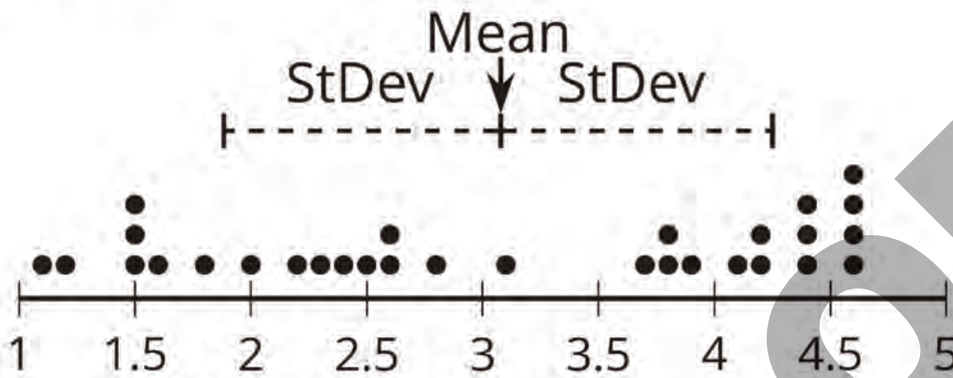



Mean: Also called the average, it is the value you get by adding up all of the values in the set and dividing by the number of values in the set.

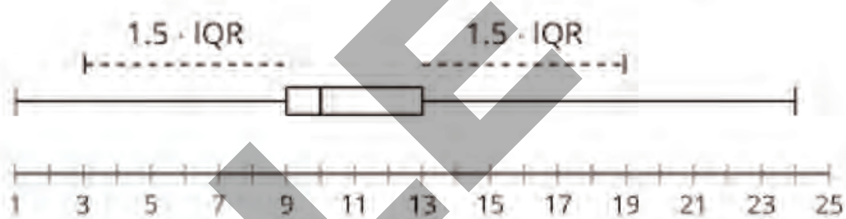

Interquartile range (IQR): A measure of variability determined by the range of values for the middle half of the data. Often used with median, this value can be determined by subtracting Q1 – Q3. In the box plot shown here, the IQR is 5 (because 9 – 4 = 5).

Mean absolute deviation (MAD): A measure of variability determined by the mean of the distances of the data points from the mean of the distribution. Often used with mean, this value is related to how widely the data are spread.

Standard deviation: A measure of the variability, or spread, of a distribution, calculated by a method similar to the method for calculating the MAD (mean absolute deviation). The exact method is studied in more advanced courses.

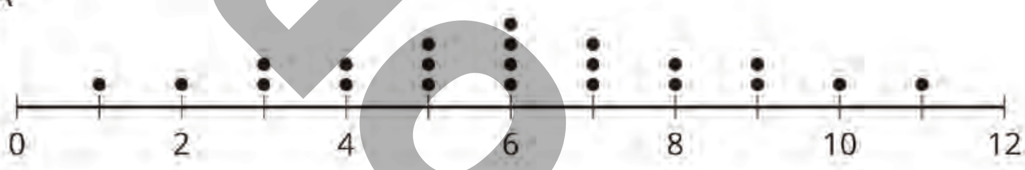



Outlier: A data value that is unusual in that it differs quite a bit from the other values in the data set. In the box plot shown, the minimum, 1, and the maximum, 24, are both outliers because they are more than 1.5 times the interquartile range away from the nearest quartile.



Card Sort: Describing Data Distributions

A



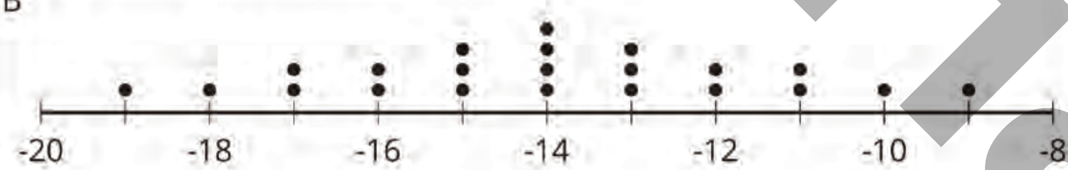

Card Sort: Describing Data Distributions

H

- skewed right
- IQR: 11

Card Sort: Describing Data Distributions

B



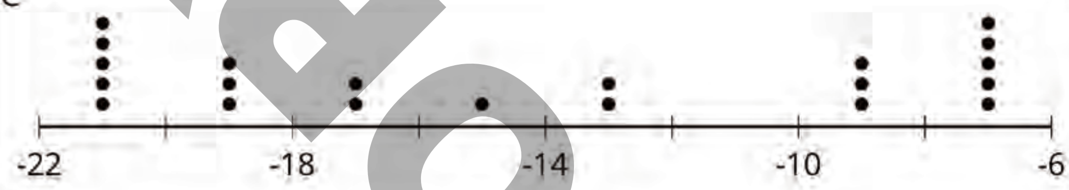

Card Sort: Describing Data Distributions

I

- symmetric
- mean: 6

Card Sort: Describing Data Distributions

C



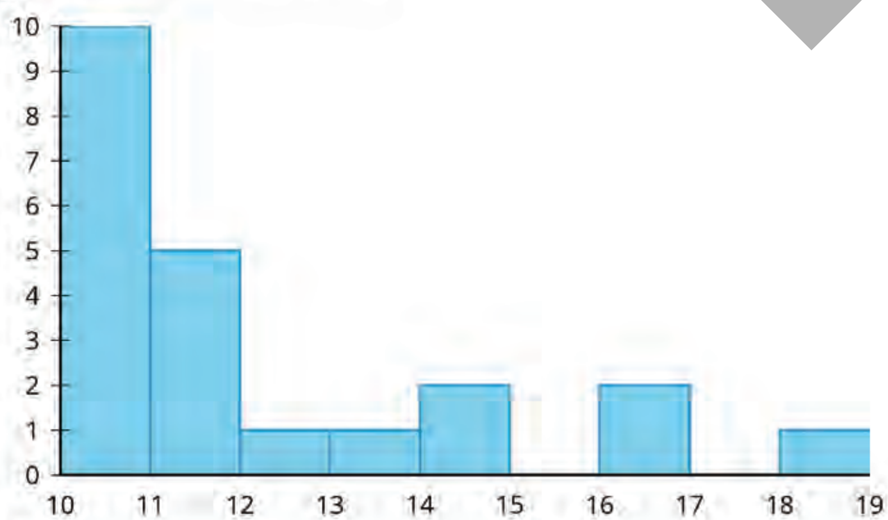

Card Sort: Describing Data Distributions

J

- skewed left
- median: 14.5

Card Sort: Describing Data Distributions

D



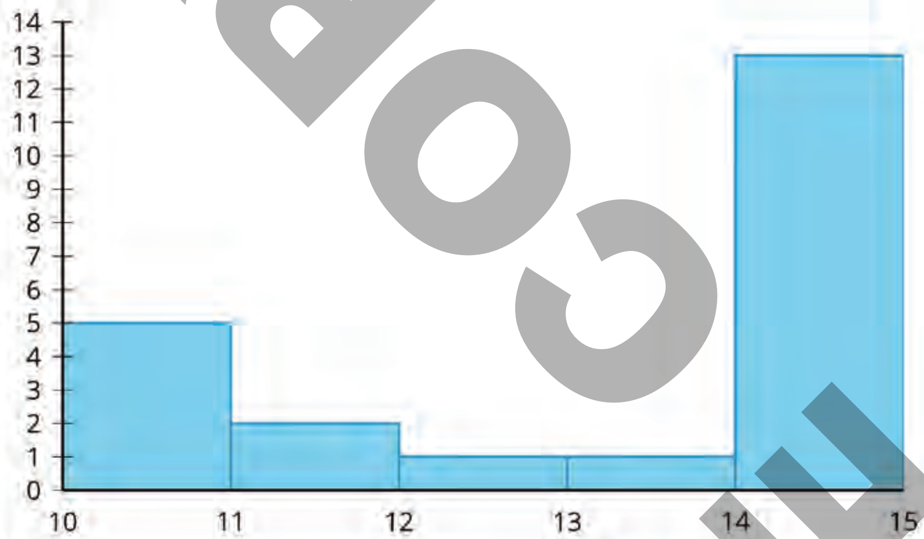

Card Sort: Describing Data Distributions

K

- uniform
- median: -14

Card Sort: Describing Data Distributions

E



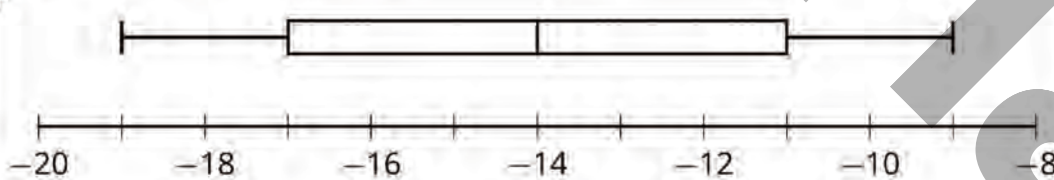

Card Sort: Describing Data Distributions

L

- mean: -14
- MAD: 2

Card Sort: Describing Data Distributions

F



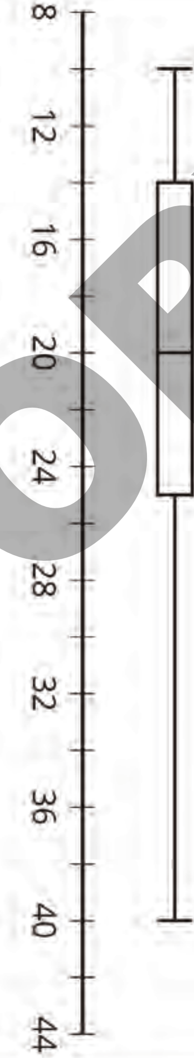

Card Sort: Describing Data Distributions

M

- skewed right
- median: 11

Card Sort: Describing Data Distributions

G




Card Sort: Describing Data Distributions

N

- mean: -14
- MAD: 5.18

## Algebra 1 Unit 1 Useful Terms and Displays

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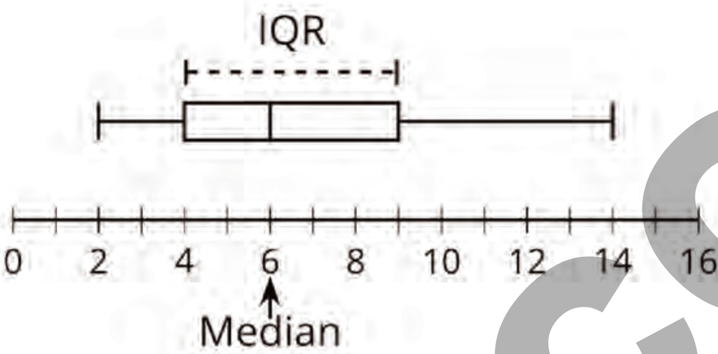


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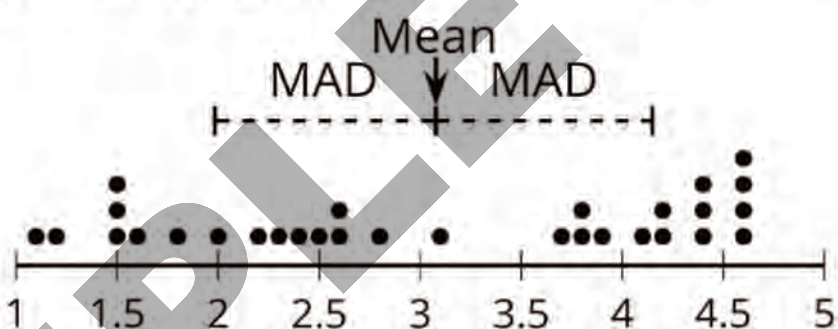


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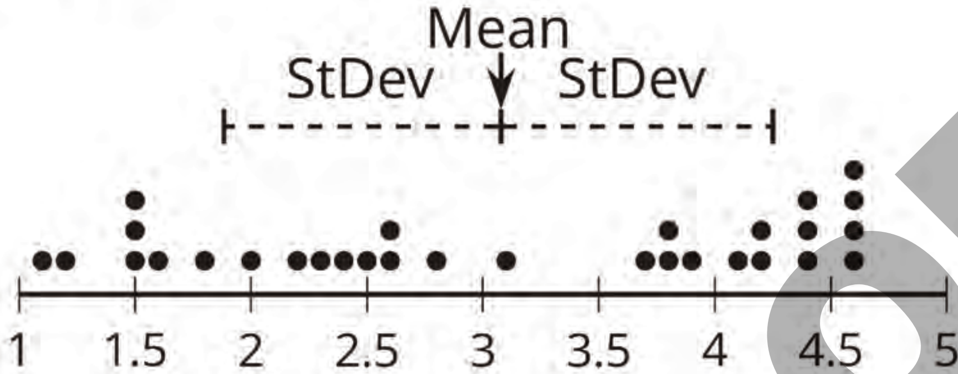


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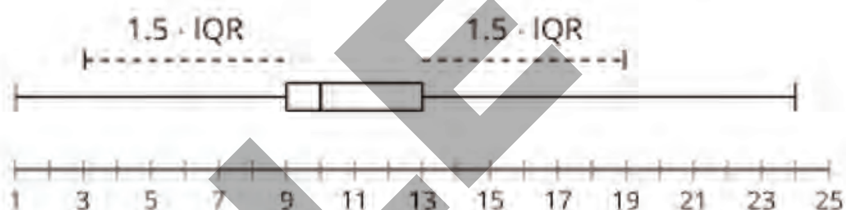


Info Gap: African and Asian Elephants

## Problem Card 1

Masses for two different populations of African elephants at different locations are recorded.

a. Which of the populations has a heavier typical mass? Explain your reasoning.
b. Which of the populations has greater variability in masses? Explain your reasoning.

Info Gap: African and Asian Elephants

## Data Card 1

Population A

- Mean: 4,872 kilograms
- Median: 4,948 kilograms
- Standard deviation: 550 kilograms
- Interquartile range: 972 kilograms
- The distribution is symmetric

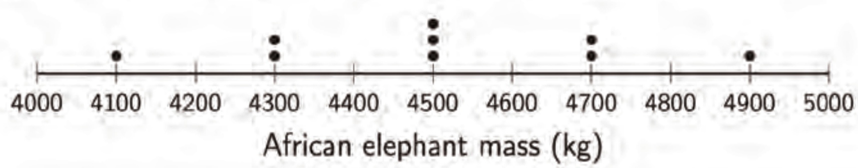
Population B

- Mean: 4,743 kilograms
- Median: 4,761 kilograms
- Standard deviation: 626 kilograms
- Interquartile range: 904 kilograms
- The distribution is symmetric

Info Gap: African and Asian Elephants

## Problem Card 2

Scientists compared masses for a sample of African elephants to the masses for a sample of Asian elephants.




Although the comparative analysis can be found, the dot plot and the data have been lost for the Asian elephants. Draw a possible dot plot for the Asian elephants that fits the comparison.

Info Gap: African and Asian Elephants

## Data Card 2

- The mean mass for the African elephants is 4,500 kilograms.
- The standard deviation for the mass of African elephants is 245 kilograms.
- The mean mass for the Asian elephants is 2,000 kilograms less than the mean mass for the African elephants.
- The standard deviation for the Asian elephants is less than the standard deviation for the African elephants.
- The shape of the distributions for both types of elephants is the same.
- The samples each included 9 individual elephants.

## Algebra 1 Unit 1 Useful Terms and Displays

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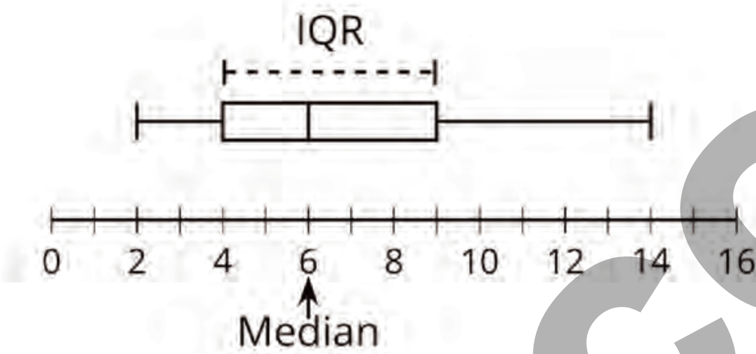


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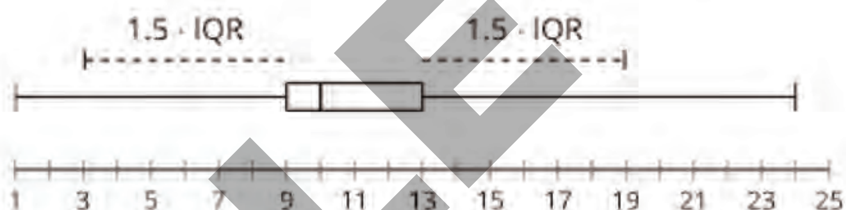

| handedness | height (cm) | foot length (cm) | arm span (cm) |
|---|---|---|---|
| Left-Handed | 173 | 25 | 170 |
| Left-Handed | 134 | 65 | 136 |
| Left-Handed | 165 | 21 | 168 |
| Left-Handed | 180 | 27 | 181 |
| Left-Handed | 156 | 23.5 | 158 |
| Left-Handed | 179 | 25 | 179 |
| Left-Handed | 175 | 25 | 170 |
| Left-Handed | 189 | 27 | 192 |
| Left-Handed | 165 | 21.3 | 176.8 |
| Left-Handed | 157.5 | 21.5 | 162.6 |
| Left-Handed | 152 | 21 | 140 |
| Left-Handed | 162 | 24 | 177 |
| Left-Handed | 61 | 24 | 147 |
| Left-Handed | 173 | 25.4 | 162.5 |
| Left-Handed | 188 | 28 | 191 |
| Left-Handed | 164 | 25.4 | 96 |
| Left-Handed | 178 | 23 | 183 |
| Left-Handed | 173.6 | 24 | 179.4 |
| Left-Handed | 173 | 24 | 184 |
| Left-Handed | 157 | 24 | 37 |
| Left-Handed | 181 | 25 | 170 |
| Left-Handed | 198 | 29 | 183 |
| Left-Handed | 152.4 | 21.3 | 133 |
| Left-Handed | 175 | 19 | 172 |
| Left-Handed | 160 | 25 | 120 |

| handedness | height (cm) | foot length (cm) | arm span (cm) |
|---|---|---|---|
| Right-Handed | 172.2 | 26.6 | 172.2 |
| Right-Handed | 180 | 27 | 168 |
| Right-Handed | 184 | 28 | 183 |
| Right-Handed | 165 | 26 | 150 |
| Right-Handed | 171 | 26 | 175 |
| Right-Handed | 23 | 22 | 150 |
| Right-Handed | 75 | 32 | 92 |
| Right-Handed | 179 | 29 | 171 |
| Right-Handed | 174 | 28 | 194 |
| Right-Handed | 154 | 22 | 149 |
| Right-Handed | 165.1 | 28 | 171 |
| Right-Handed | 61 | 12 | 30 |
| Right-Handed | 177 | 25.4 | 180 |
| Right-Handed | 167 | 26 | 171 |
| Right-Handed | 172 | 27 | 178 |
| Right-Handed | 163 | 27 | 165 |
| Right-Handed | 162 | 22 | 154 |
| Right-Handed | 170 | 25.7 | 67 |
| Right-Handed | 184 | 26 | 176 |
| Right-Handed | 166 | 24 | 158 |
| Right-Handed | 171 | 27 | 184 |
| Right-Handed | 152 | 24 | 159 |
| Right-Handed | 60 | 25.5 | 143 |
| Right-Handed | 177 | 27.5 | 178 |
| Right-Handed | 174 | 45 | 87.5 |
| Right-Handed | 150 | 21 | 152 |
| Right-Handed | 157 | 21.5 | 161 |
| Right-Handed | 183 | 28 | 75 |
| Right-Handed | 152.8 | 22 | 152.8 |
| Right-Handed | 160 | 23 | 163 |
| Right-Handed | 171 | 24 | 170 |
| Right-Handed | 153.5 | 22 | 154 |
| Right-Handed | 176 | 25 | 178 |
| Right-Handed | 170 | 23 | 162 |
| Right-Handed | 165 | 25 | 171 |
| Right-Handed | 162.5 | 22.8 | 168.9 |
| Right-Handed | 183 | 26 | 185 |
| Right-Handed | 182.8 | 27.94 | 187.9 |
| Right-Handed | 188 | 28 | 189 |
| Right-Handed | 159 | 25 | 162 |
| Right-Handed | 180 | 26 | 165 |
| Right-Handed | 180 | 27 | 200 |
| Right-Handed | 10 | 1 | 3 |
| Right-Handed | 155 | 23 | 145 |
| Right-Handed | 153 | 22 | 154 |
| Right-Handed | 164 | 22 | 62.5 |
| Right-Handed | 74 | 24 | 181 |
| Right-Handed | 156.5 | 22.5 | 65 |