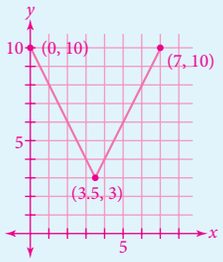
15a. Let x represent time in seconds, and let y represent distance in meters.



Exercise 17 Exponential functions here are defined with positive bases, b, where $b \geq 1$. If students try to graph these functions, they will see that exponentials with negative bases have real values only at discrete points. In general, when the base of an exponential function is negative, the function produces complex values. Students can get a good estimate by graphing and tracing. Or if they're familiar with properties of exponents, they can simplify the equation $\frac{5200}{5000} = \left(\frac{1.035}{1.032}\right)^x$ to $1.04 = 1.0029^x$. Repeatedly multiplying 1.0029 by itself shows that x is between 13 and 14 years.

Exercise 18 Diagrams for 18a may or may not have dotted lines. Students might say correctly that the first step in 16b could be $x(x - 4) + 6(x - 4)$.

See your digital resources for the **Project: The Cost of Living**, where students compare the price of an item over the years to find doubling time and predict future cost of the item.

Review

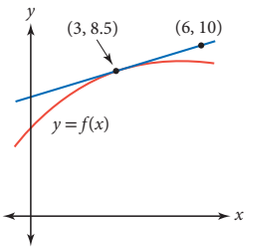
15. Janell starts 10 m from a motion sensor and walks at 2 m/s toward the sensor. When she is 3 m from the sensor, she instantly turns around and walks at the same speed back to the starting point.

a. Sketch a graph of the function that models Janell's walk.

b. Give the domain and range of the function. domain: $0 \leq x \leq 7$; range: $3 \leq y \leq 10$

c. Write an equation of the function. $y = 2|x - 3.5| + 3$

16. The graph shows a line and the graph of $y = f(x)$.



a. Fill in the missing values to make a true statement.

$f(\underline{?}) = \underline{?}$. $f(3) = 8.5$

b. Find the equation of the pictured line.
$y = 8.5 + 0.5(x - 3)$, $y = 10 + 0.5(x - 6)$, or $y = 7 + 0.5x$

17. Austin deposits \$5,000 into an account that pays 3.5% annual interest. Sami deposits \$5,200 into an account that pays 3.2% annual interest.

a. Write an expression for the amount of money Austin will have in his account after 5 years if he doesn't deposit any more money. $A = 5000(1 + 0.035)^5$

b. Write an expression for the amount of money Sami will have in her account after 5 years if she doesn't deposit any more money. $S = 5200(1 + 0.032)^5$

c. How long will it take until Austin has more money than Sami?
After 14 years, Austin will have \$8,093.47, and Sami will have \$8,082.

18. You can use different techniques to find the product of two binomials, such as $(x - 4)(x + 6)$.

a. Use a rectangle diagram to find the product.

18a.

	x	6
x	x^2	$6x$
-4	$-4x$	-24

b. You can use the distributive property to rewrite the expression $(x - 4)(x + 6)$ as $x(x + 6) - 4(x + 6)$. Use the distributive property again to find all the terms. Combine like terms. $x^2 + 2x - 24$

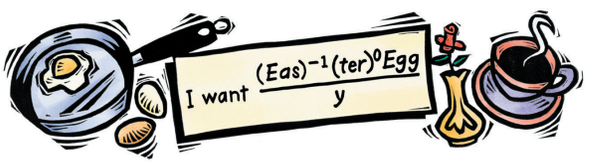
c. Compare your answers to 18a and b. Are they the same? yes

d. Compare the methods in 18a and b. How are they alike? A rectangle diagram also uses the distributive property. Each term in the first binomial is multiplied by each term in the second binomial.

IMPROVING YOUR Reasoning SKILLS

Breakfast Is Served

Mr. Higgins told his wife, a mathematics professor, that he would make her breakfast. She handed him this message:



What should Mr. Higgins fix his wife for breakfast?

IMPROVING YOUR Reasoning SKILLS

$\frac{(Eas)^{-1}(ter)^0 Egg}{y} = \frac{1 Egg}{Easy}$, or "one egg over easy"

ELL Students new to English may be unfamiliar with the expression for this way of frying an egg.