

Unit 1 - Lesson 1

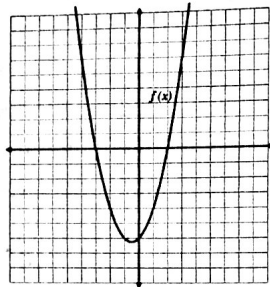
SECONDARY MATH II // 4.1
MORE FUNCTIONS, MORE FEATURES

Name _____ Period _____ Date _____

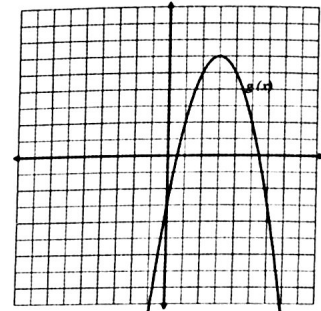
READY

Topic: Reading function values in a piece-wise defined graph.
Use the graph to find the indicated function value.

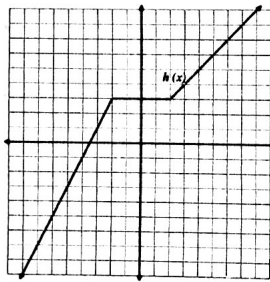
- 1a. $f(-3) = 0$
- b. $f(-2) = -4$
- c. $f(0) = -6$
- d. $f(2) = 0$



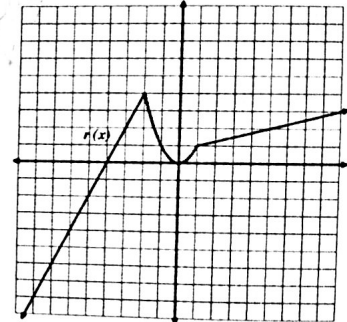
- 2a. $g(0) = -3$
- b. $g(2) = 5$
- c. $g(3) = 6$
- d. $g(5) = 2$



- 3a. $h(-4) = -1$
- b. $h(0) = 3$
- c. $h(2) = 3$
- d. $h(4) = 5$

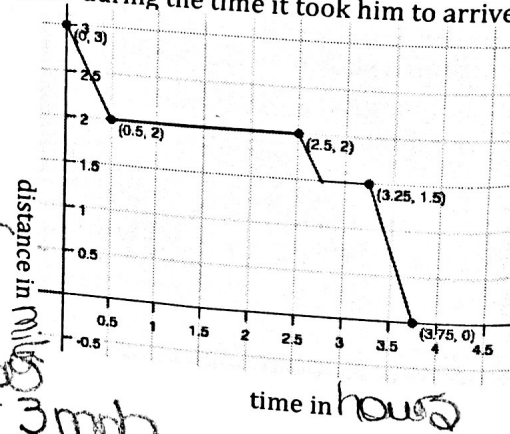


- 4a. $r(-3) = 2$
- b. $r(-1) = 1$
- c. $r(0) = 0$
- d. $r(5) = 2$



5. Isaac lives 3 miles away from his school. School ended at 3 pm and Isaac began his walk home with his friend Tate who lives 1 mile away from the school, in the direction of Isaac's house. Isaac stayed at Tate's house for a while and then started home. On the way he stopped at the library. Then he hurried home. The graph at the right is a **piece-wise defined function** that shows Isaac's distance from home during the time it took him to arrive home.

- a. How much time passed between school ending and Isaac's arrival home? *3.75 hrs*
- b. How long did Isaac stay at Tate's house? *2 hrs*
- c. How far is the library from Isaac's house? *1.5 miles*
- d. Where was Isaac, 3 hours after school ended? *library*
- e. Use function notation to write a mathematical expression that says the same thing as question d. *$f(3) = 1.5$*
- f. When was Isaac walking the fastest? How fast was he walking? *Between the library & his house. He was walking at a rate of 1.5 or 3 mph*



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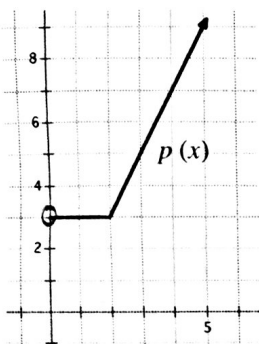
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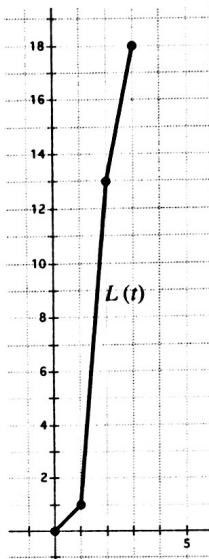
SET

Topic: Writing piece-wise defined functions

6. A parking garage charges \$3 for the first two hours that a car is parked in the garage. After that, the hourly fee is \$2 per hour. Write a piece-wise function $p(x)$ for the cost of parking a car in the garage for x hours. (The graph of $p(x)$ is shown.)



$$p(x) = \begin{cases} 3, & 0 \leq x \leq 2 \\ 2(x-2)+3, & x > 2 \\ \text{or } 2x-1 \end{cases}$$



7. Lexie completed an 18 mile triathlon. She swam 1 mile in 1 hour, bicycled 12 miles in 1 hour, and then ran 5 miles in 1 hour. The graph of Lexie's distance versus time is shown. Write a piecewise function $L(t)$ for the graph.

$$L(t) = \begin{cases} t, & 0 \leq t \leq 1 \\ 12(t-1)+1, & 1 < t \leq 2 \\ \text{or } 12t-11 \\ 5(t-2)+13, & 2 < t \leq 3 \\ \text{or } 5t+3 \end{cases}$$

GO

Topic: Using the point-slope formula to write the equations of lines.

Write the equation of the line (in point-slope form) that contains the given slope and point.

8. $p: (1, 2); m = 3$
 $y - 2 = 3(x - 1)$
 $y = 3(x - 1) + 2$

9. $p: (1, -2); m = -1$
 $y + 2 = -1(x - 1)$
 $y = -1(x - 1) - 2$

10. $p: (5, -1); m = 2$
 $y + 1 = 2(x - 5)$
 $y = 2(x - 5) - 1$

Write the equation of the line (in point-slope form) that contains the given points.

11. $K(0, 0); L(-4, 5)$
 $m = \frac{5-0}{-4-0} = -\frac{5}{4}$
 $y = -\frac{5}{4}x$
 $y = -\frac{5}{4}(x+4) + 5$

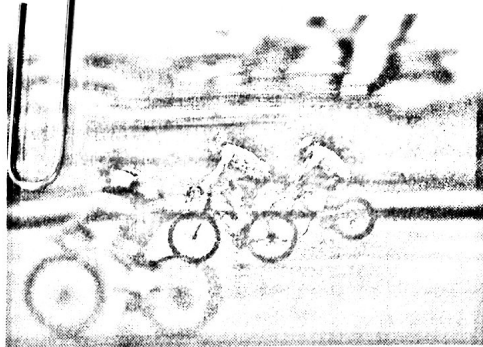
12. $X(-1, 7); Y(3, -1)$
 $m = \frac{-1-7}{3-(-1)} = \frac{-8}{4} = -2$
 $y = -2(x+1) + 7$
 $y = -2x - 2 + 7$

13. $T(-1, -9); V(5, 18)$
 $m = \frac{18-(-9)}{5-(-1)} = \frac{27}{6} = \frac{9}{2}$
 $y = \frac{9}{2}(x+1) - 9$
 $y = \frac{9}{2}(x-5) + 18$

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Lesson 2: Bike Lovers

A Solidify Understanding Task



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Michelle and Rashid love going on long bike rides.

Every Saturday, they have a particular route they bike together that takes four hours. Below is a piecewise function that estimates the distance they travel for each hour of their bike ride.

$$f(x) = \begin{cases} 16x, & 0 \leq x \leq 1 \\ 10(x-1) + 16, & 1 < x \leq 2 \\ 14(x-2) + 26, & 2 < x \leq 3 \\ 12(x-3) + 40, & 3 < x \leq 4 \end{cases}$$

↑ Time ↑ Distance

"Notice & Wonder"

1. What part of the bike ride are they going the fastest? Slowest?

fastest: $0 \leq x \leq 1$ (16 is greatest slope) slowest: $1 < x \leq 2$ (10 is the least slope)

2. What is the domain of this function?

$[0, 4]$

3. Find $f(2)$. Explain what this means in terms of the context.

$f(2) = 10(2-1) + 16 = 26$ At two hours, they have traveled 26 miles

4. How far have they traveled at 3 hours? Write the answer using function notation.

$f(3) = 14(3-2) + 26 = 40$ $f(3) = 40$

5. What is the total distance they travel on this bike ride?

$f(4) = 12(4-3) + 40 = 52$ $\therefore 52$ miles

6. Sketch a graph of the bike ride as a function of distance traveled over time.

On graph paper

