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Unit 4 Lesson 15 Cumulative Practice Problems

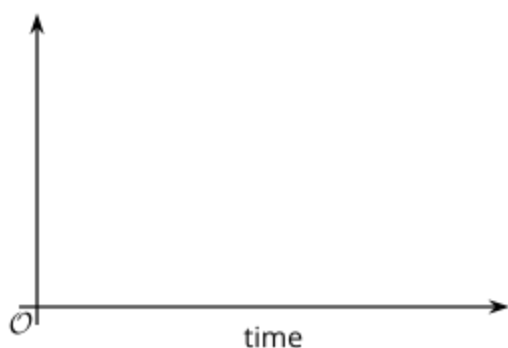
1. Noah's cousin is exactly 7 years younger than Noah. Let C represent Noah's cousin's age and N represent Noah's age. Ages are measured in years.
 - a. Write a function that defines the cousin's age as a function of Noah's age. What are the input and output of this function?
 - b. Write the inverse of the function you wrote. What are the input and output of this inverse function?
2. Noah's cousin is exactly 7 years younger than Noah. Let M represent Noah's cousin's age in months and N represent Noah's age in years.
 - a. If Noah is 15 years old, how old is his cousin, in months?
 - b. When Noah's cousin is 132 months old, how old is Noah, in years?
 - c. Write a function that gives the age of Noah's cousin in months, as a function of Noah's age in years.
 - d. Write the inverse of the function you wrote. What are the input and the output of this inverse function?
3. Each equation represents a function. For each, find the inverse function.
 - a. $c = w + 3$
 - b. $y = x - 2$
 - c. $y = 5x$
 - d. $w = \frac{d}{7}$
4. The number of years, y , is a function of the number of months, m . The number of months, m , is also a function of the number of years, y .
 - a. Write two equations, one to represent each function.
 - b. Explain why the two functions are inverses.
5. Sketch a graph to represent each quantity described as a function of time. Be sure to label the vertical axis.

Swing: The height of your shoes above ground while swinging on a swing at a playground

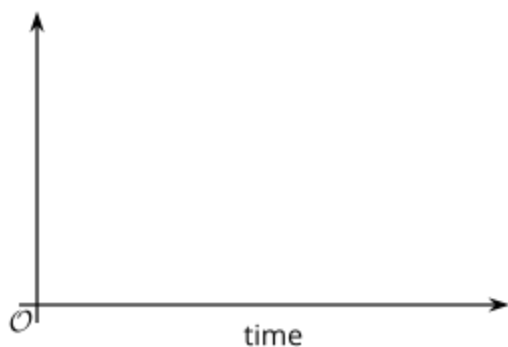
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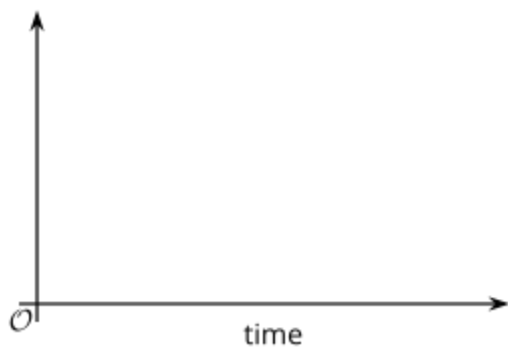
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Slide: The height of your shoes above ground as you walk to a slide, go up a ladder, and then go down a slide



Merry-go-round: Your distance from the center of a merry-go-round as you ride the merry-go-round

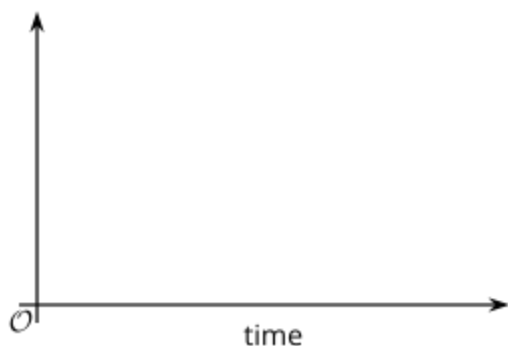


Merry-go-round, again: Your distance from your friend, who is standing next to the merry-go-round as you go around

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(From Unit 4, Lesson 8.)

6. Lin charges \$5.50 per hour to babysit. The amount of money earned, in dollars, is a function of the number of hours that she babysits.

Which of the following inputs is impossible for this function?

- a. -1
 - b. 2
 - c. 5
 - d. 8
7. The instructions for cooking a steak with a pressure cooker can be represented with this set of rules, where x represents the weight of a steak in ounces and $f(x)$ the cooking time in minutes.

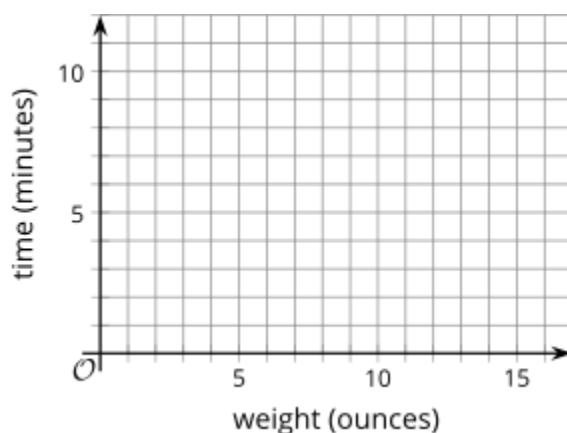
$$f(x) = \{7, 8 \leq x \leq 12 \ 8, 12 < x \leq 13 \ 9, 13 < x \leq 14 \ 10, 14 < x \leq 15 \ 11, 15 < x \leq 16$$

- a. Describe the instructions in words so that they can be followed by someone using the pressure cooker.
- b. Graph function f .

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(From Unit 4, Lesson 12.)

8. The absolute value function $Q(x) = |x|$ gives the distance from 0 of the point x on the number line.

Q can also be defined using piecewise notation: $Q(x) = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$

Determine if each point is on the graph of Q . For each point that you believe is *not* on the graph of Q , change the output coordinate so that the point is on the graph of Q .

- a. $(-3, 3)$
- b. $(0, 0)$
- c. $(-5, -5)$
- d. $(-72, 72)$
- e. $(\frac{4}{5}, -\frac{4}{5})$

(From Unit 4, Lesson 14.)



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