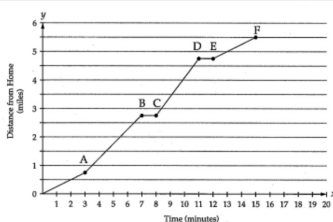


DO NOW

The graph at right shows Michelle driving to work.



- Which of the following could describe what happened between B and C?
 - Michelle drove away from home.
 - Michelle drove toward her home.
 - Michelle increased her speed.
 - Michelle stopped at a stoplight.
- Which of the following describes what happened at A?
 - Michelle reduced her speed.
 - Michelle drove toward her home.
 - Michelle increased her speed.
 - Michelle stopped at a stoplight.

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3.5 Functions

x - input - independent variable - DOMAIN

* values that can be "plugged in"

y - output - dependent variable - RANGE

* answers that will be achieved

function - pairs each element of the DOMAIN with one and only one element of the RANGE

* No two ordered pairs have the same x -value

In functions - the y can be replaced by: $f(x)$ or $g(x)$ or $h(t)$

* letter in parentheses is the input letter

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Recall: Evaluate $2x + 5$ for $x = 3$

$$\begin{aligned} 2(3) + 5 \\ 6 + 5 \\ 11 \end{aligned}$$

Similar problem - different notation:

$$f(x) = 2x + 5$$

*** function notation

$$f(x) \rightarrow \text{"f of x"}$$

Find $f(3) = 2(3) + 5$

$$\begin{aligned} 6 + 5 \\ 11 \end{aligned}$$

3. If $f(x) = 5x + 1$, find $f(-2)$

$$\begin{aligned} f(-2) &= 5(-2) + 1 \\ f(-2) &= -10 + 1 \\ f(-2) &= -9 \end{aligned}$$

4. If $k(t) = t^2 - 7$, find $k(4)$

$$\begin{aligned} k(4) &= 4^2 - 7 \\ k(4) &= 16 - 7 \\ k(4) &= 9 \end{aligned}$$

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5. If $f(x) = 2x + 5$ and $f(x) = 17$, what is the value of x ?

$$\begin{aligned} 17 &= 2x + 5 \\ 17 - 5 &= 2x \\ 12 &= 2x \\ \frac{12}{2} &= x \\ 6 &= x \end{aligned}$$

6. Write a function in the form $f(x) = mx + b$ given:

$f(-1) = 3$ and $m = 2$.

$$\begin{aligned} f(x) &= y \\ (-1, 3) \end{aligned}$$

$$y - y_1 = m(x - x_1)$$

$$\begin{aligned} y - 3 &= 2(x - (-1)) \\ y - 3 &= 2x + 2 \end{aligned}$$

$$\begin{aligned} y &= 2x + 2 + 3 \\ y &= 2x + 5 \\ f(x) &= 2x + 5 \end{aligned}$$

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7. Given the function $f(x) = x - 2$ with a domain of $\{1, 2, 3, 4\}$, identify the range?

$$\begin{aligned} f(1) &= 1 - 2 = -1 \\ f(2) &= 2 - 2 = 0 \\ f(3) &= 3 - 2 = 1 \\ f(4) &= 4 - 2 = 2 \end{aligned}$$

$$\text{range: } \{-1, 0, 1, 2\}$$

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HOMEWORK

Worksheet - HW 3.5 Functions; 1 - 11

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