# Function Notation

**function notation** is a way to use an equation to write a rule for a function. For example, in function notation, the

equation _$y = x + 7$_ is written as _$f(x) = x + 7$_ and is read as _" f of x "_.

In function notation, **f(x)** denotes the y-value corresponding to the x-value. For example, for the function $f(x) = x + 7$,

$f(9)$ represents the output value that corresponds to the input value $x = 9$. Therefore, ___$y = 16$___.

↳ Take $x = 9$ and plug in for $x$, then find $y$.

$f(x) = 16$

## Use and Interpret Function Notation

Candace runs a company that installs fences. She calculates the total cost C of installing a fence using the function rule $C(x) = 5x + 25$, where x is the length of the fence in feet.

**a. REASON QUANTITATIVELY** What is the value of $C(17.5)$? What does $C(17.5)$

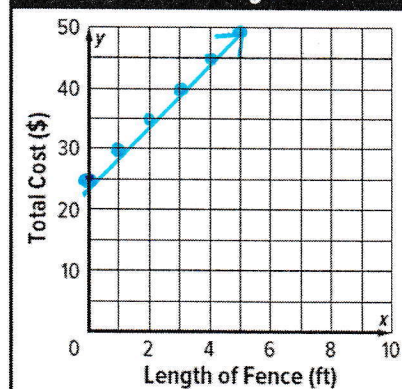represent? **TEKS 12.B, 1.A**

$x$

$$C(17.5) = 5(17.5) + 25$$
$$= 112.5 \quad \text{is total cost}$$

**b. USE A MODEL** Explain how Candace can use the function rule to find the cost of the installing a fence that is 11 yards long. **TEKS 12.B, 1.A, 1.G**

you would do $C(11)$
(plug in $x = 11$)

**c. USE A MODEL** Graph $C(x)$ on the coordinate plane at the right. **TEKS 3.C, 1.D**

**e. COMMUNICATE PRECISELY** Did you draw the graph as a discrete function or as a continuous function? Justify your choice. **TEKS 2.A, 1.G**

Continuous (solid line)
you can buy 1.5 ft. of fencing



**Cost of Installing a Fence**

**You can evaluate equations in function notation just like you evaluate expressions.**

$f(x) = 3x + 4$

Evaluate f(4)
↑
x

$f(4) = 3(4) + 4$

$= 12 + 4$

$= \boxed{16}$

$g(c) = c^2 + 2c + 6$

Evaluate g(-1)
↑
c

$g(-1) = (-1)^2 + 2(-1) + 6$
            $-1 \cdot -1$

$= 1 - 2 + 6$

$= -1 + 6$

$= \boxed{5}$

$h(v) = 7 - 6v$

Evaluate $h\left(\frac{1}{3}\right)$
↑
v

$h\left(\frac{1}{3}\right) = 7 - 6\left(\frac{1}{3}\right)$

$= 7 - 2$

$= \boxed{5}$

$k(x) = 6x - 12$

Find x if $k(x) = 18$

$18 = 6x - 12$
$+12 \qquad +12$

$\dfrac{30}{6} = \dfrac{6x}{6}$

$\boxed{5 = x}$

**Answer each of the following using this graph:**

Find f( -1)

Find a point $\left(-1, \dfrac{-3}{y}\right)$
                $x$

$f(-1) = \boxed{-3}$

Find f(2)

Find a point $\left(2, \dfrac{1}{y}\right)$
                $x$

$f(2) = \boxed{1}$

Find x when f(x) = 2
                    y

Find a point $\left(\dfrac{3}{x}, \underset{y}{2}\right)$

$\boxed{x = 3}$

or $f(3) = 2$

(3,2)

(2,1)

(-1,-3)
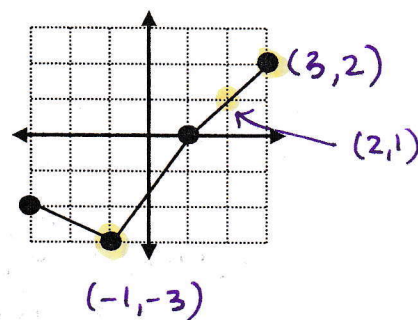
# PRACTICE STAAR QUESTION

Given $f(x) = \frac{1}{3}(4 - x)^2$, what is the value of $f(16)$?
                                        ↑ x

Record your answer and fill in the bubbles on your answer document.

$= \dfrac{1}{3}(4 - 16)^2$

$= \dfrac{1}{3}(-12)^2$
        $-12 \cdot -12$

$= \dfrac{1}{3}(144)$   Same as   $3\overline{)144}$

$f(16) = \boxed{48}$

48
$3\overline{)144}$
12 ↓
24