

Worksheet Piecewise Functions
 AMDM Classwork

Name: KEY

Carefully graph each of the following. Identify whether or not the graph is a function. Then, evaluate the graph at any specified domain value. You may use your calculators to help you graph, but you must sketch it carefully on the grid!

$$1. f(x) = \begin{cases} x+5 & x < -2 \\ -2x-1 & x \geq -2 \end{cases}$$

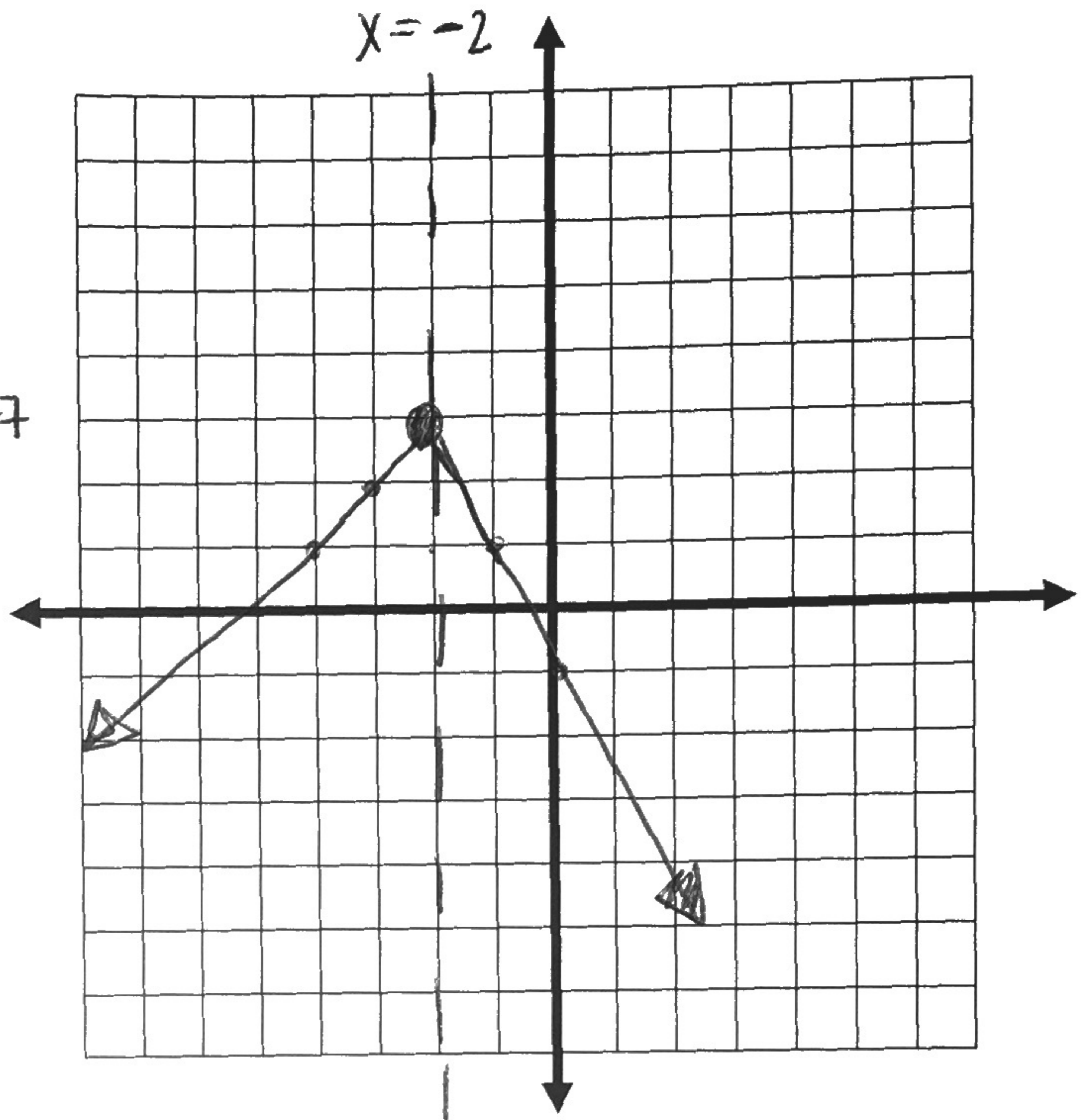
$$f(3) = -2(3) - 1 = -6 - 1 = -7$$

$$f(-4) = -4 + 5 = 1$$

$$f(-2) = -2(-2) - 1 = 4 - 1 = 3$$

not included

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



$$2. f(x) = \begin{cases} 2x+1 & x \geq 1 \\ \frac{1}{2}x-3 & x < 1 \end{cases}$$

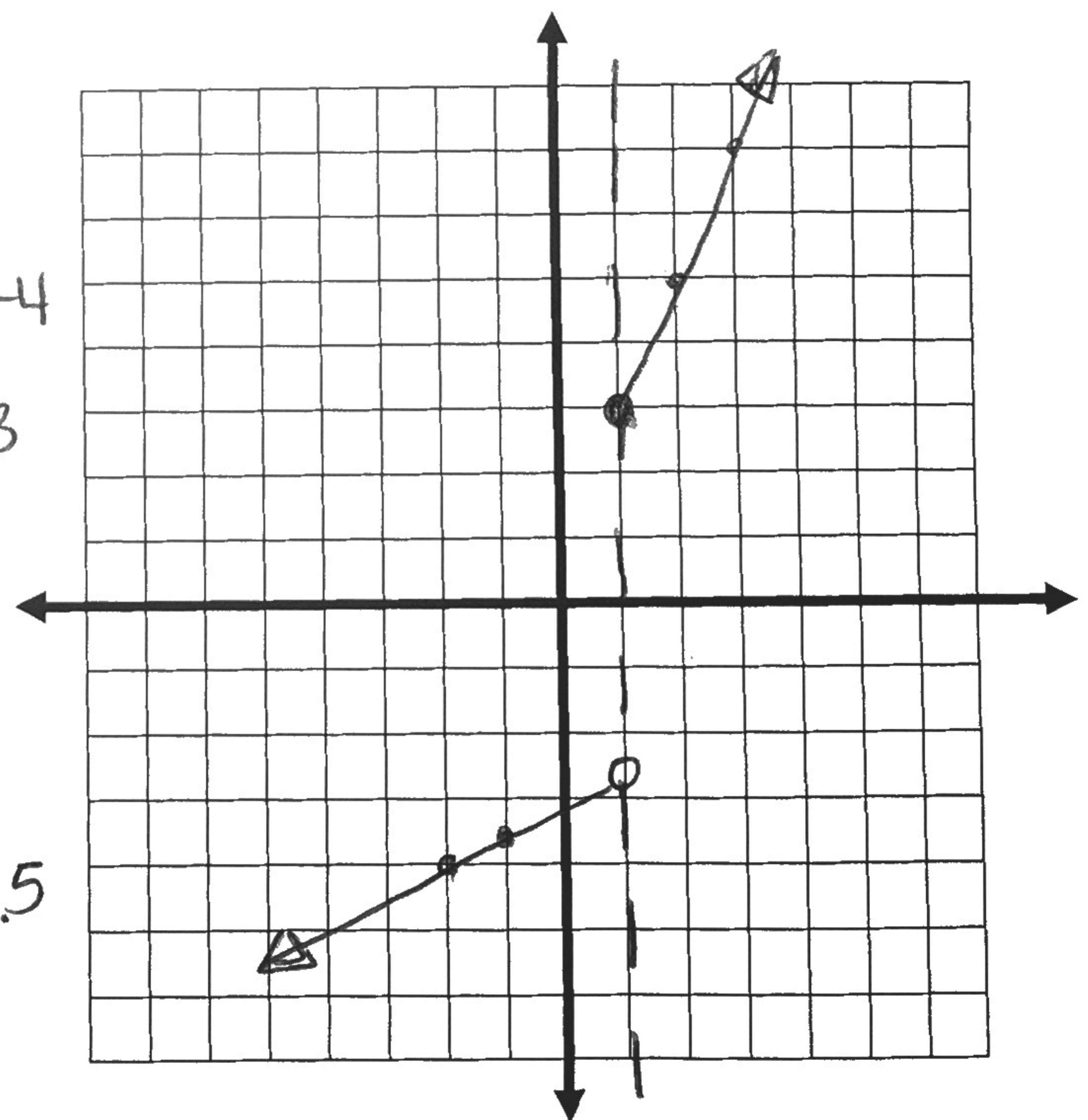
$$f(-2) = \frac{1}{2}(-2) - 3 = -1 - 3 = -4$$

$$f(6) = 2(6) + 1 = 12 + 1 = 13$$

$$f(1) = 2(1) + 1 = 2 + 1 = 3$$

not included

$$f(1) = \frac{1}{2}(1) - 3 = \frac{1}{2} - 3 = -2.5$$



3. $f(x) = \begin{cases} x+2 & x > 0 \\ -x-2 & x \leq 0 \end{cases}$

$f(-4) = -(-4) - 2 = 4 - 2 = 2$

$f(8) = 8 + 2 = 10$

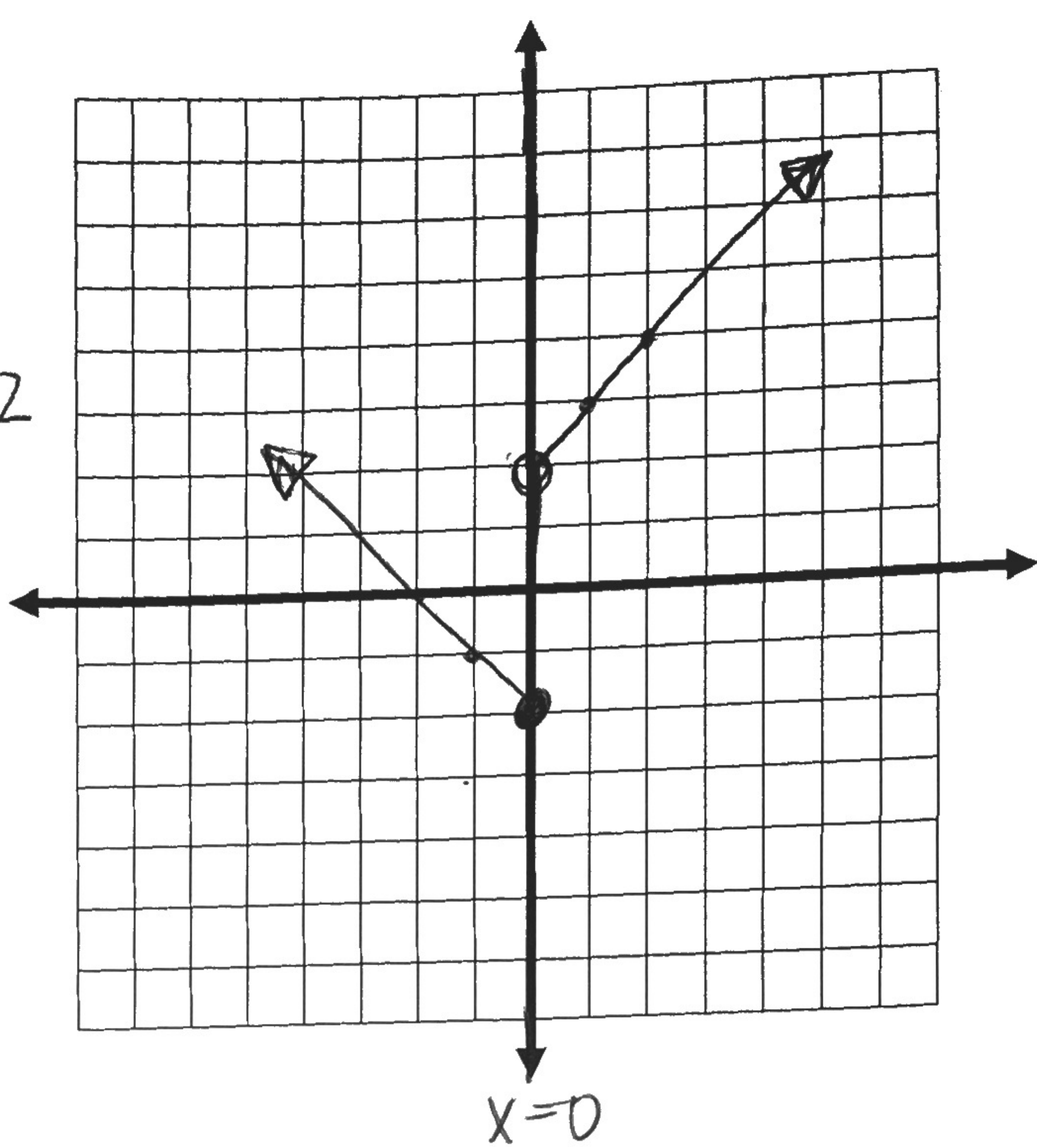
$f(2) = 2 + 2 = 4$

included:

$f(0) = -(0) - 2 = -2$

not included

$f(0) = 0 + 2 = 2$



4. $f(x) = \begin{cases} -\frac{1}{2}x - \frac{3}{2} & x < -1 \\ 2 & -1 \leq x \leq 3 \\ -x + 7 & x > 3 \end{cases}$

$f(-5) = -\frac{1}{2}(-5) - \frac{3}{2} = \frac{5}{2} - \frac{3}{2} = 1$

$f(-1) = 2$

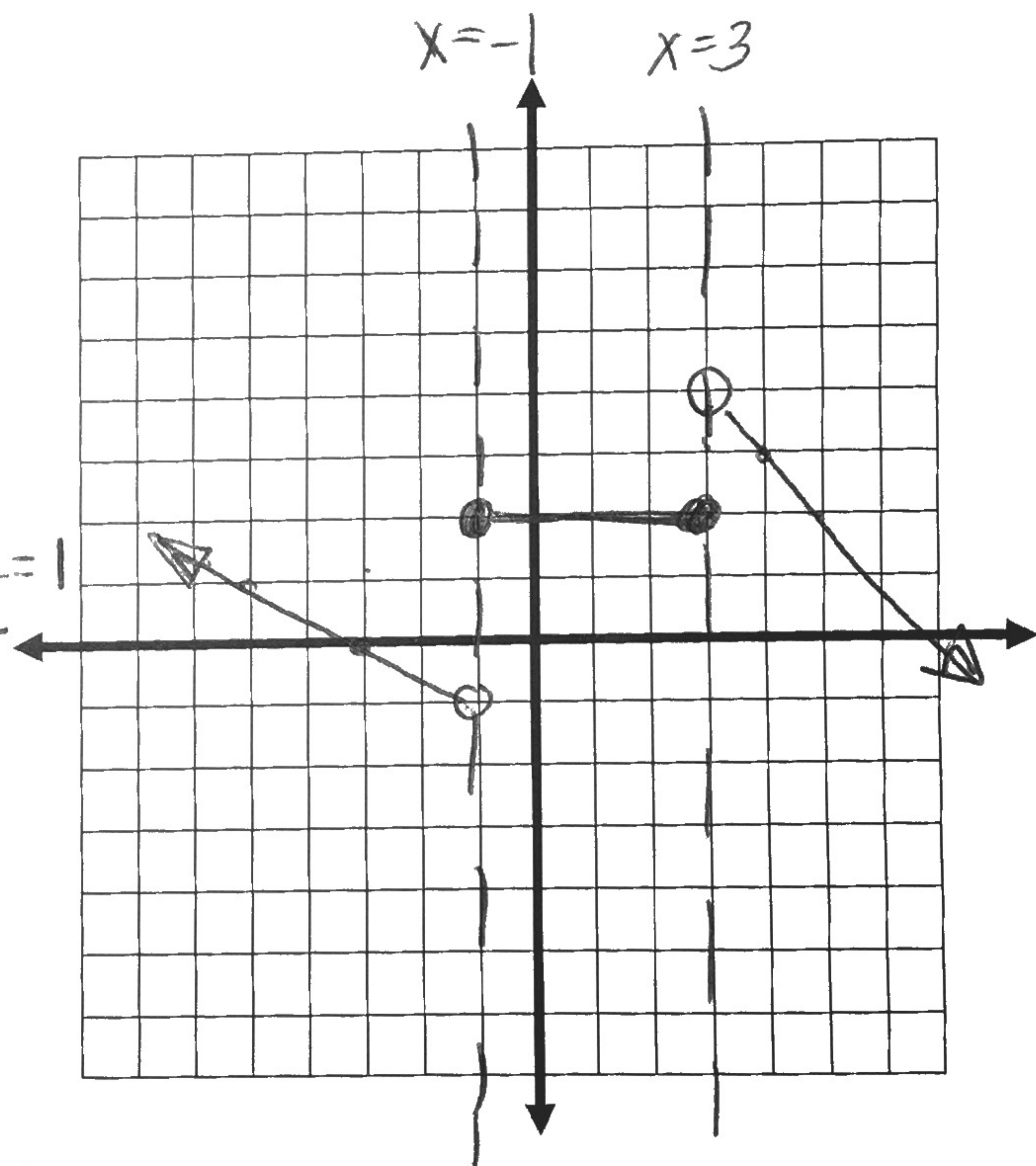
$f(1) = 2$

$f(7) = -(7) + 7 = 0$

not included

$f(-1) = -\frac{1}{2}(-1) - \frac{3}{2} = \frac{1}{2} - \frac{3}{2} = -1$

$f(3) = -(3) + 7 = 4$



Name: _____
AMDM

Date: _____ Period: _____
Graphing Piecewise Functions: Homework

$$1. f(x) = \begin{cases} -x + 1 & x \leq 0 \\ -\frac{2}{3}x - 2 & x > 0 \end{cases}$$

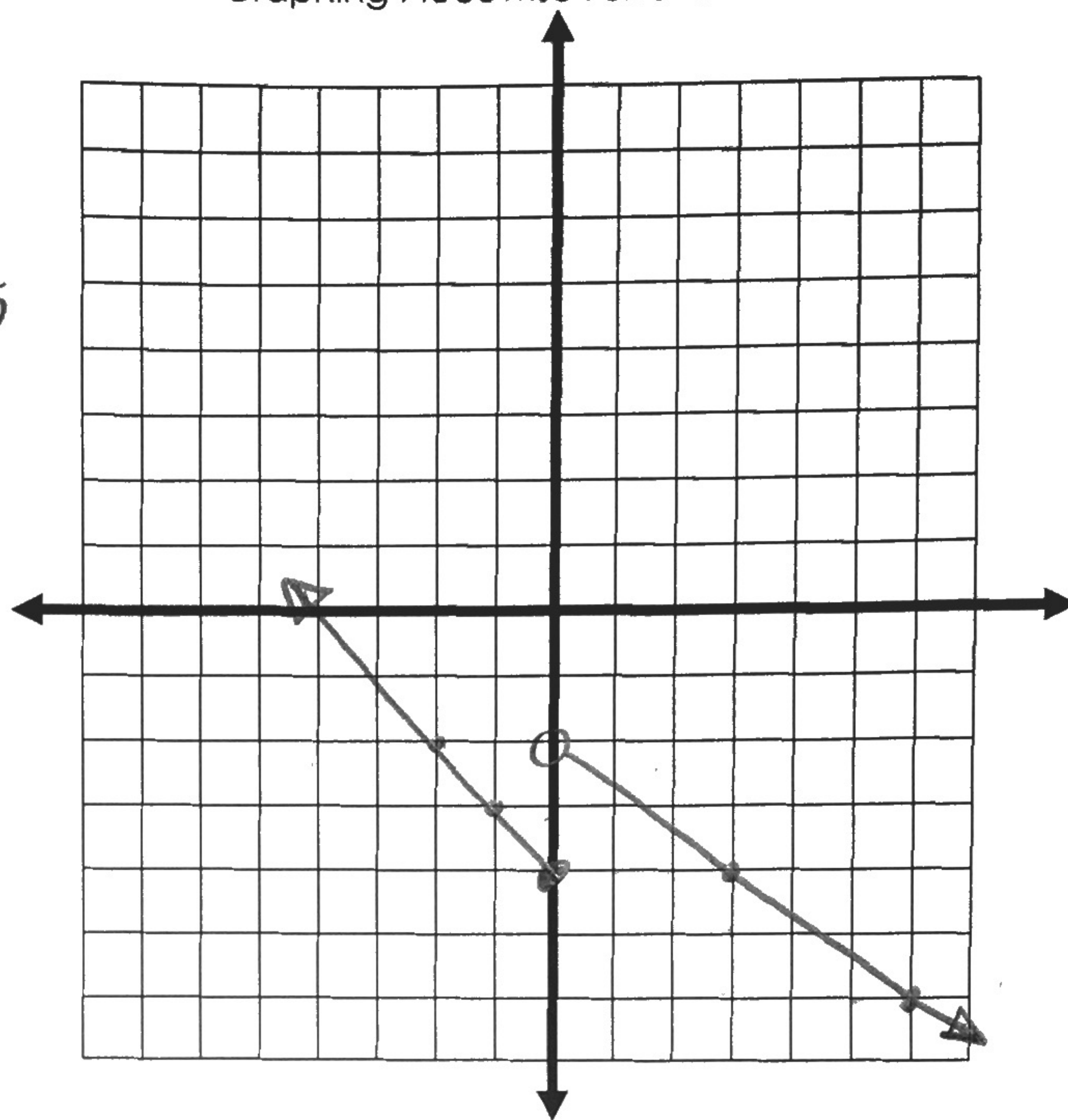
$$f(-4) = -(-4) + 1 = +4 + 1 = 5$$

$$f(0) = -(0) + 1 = 1$$

$$f(3) = -\frac{2}{3}(3) - 2 \\ = -2 - 2 = -4$$

not
included

$$f(0) = -\frac{2}{3}(0) - 2 = -2$$

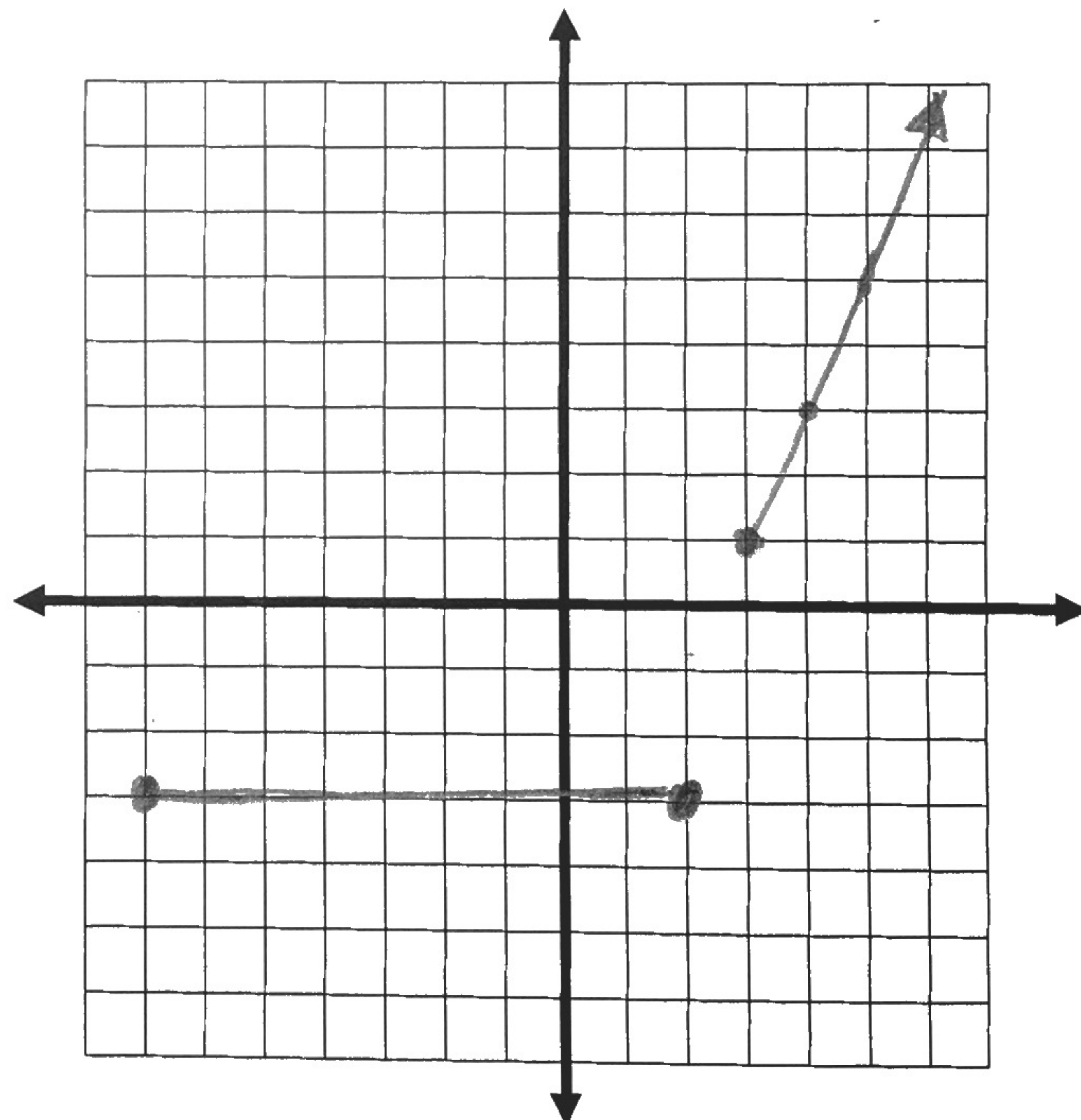


$$2. f(x) = \begin{cases} -3 & -7 \leq x \leq 2 \\ 2x - 5 & x \geq 3 \end{cases}$$

$$f(-4) = -3$$

$$f(0) = -3$$

$$f(3) = 2(3) - 5 = 1$$



3. Write the equation of the line that passes through the points (0, 30) and (5, 10)

$$m = \frac{30-10}{0-5} = \frac{20}{-5} = -4$$

$$30 = -4(0) + b$$

$$b = 30$$

$$y = -4x + 30$$

4. Find the slope of the line that passes through the points (4, -6) and (8, -2)

$$m = \frac{-2 - (-6)}{8 - 4} = \frac{4}{4} = 1$$

5. Given the following information, write the set of piecewise functions and the domain. A supermarket has a discount on "Family Packs" of meat. Chicken costs \$2.00/lb for packages that are 5 lbs or more, and \$2.50/lb for packages that are less than 5 lbs.

$$y = \begin{cases} 2x, & x \geq 5 \\ 2.50x, & x < 5 \end{cases}$$

6. In 1992, a cell phone company would charge the following rates for minute usage:

- \$0.05 per minute for up to 500 minutes
- \$0.10 per minute for more than 500 minutes to 1,000 minutes
- \$0.15 per minute for more than 1,000 minutes

a. Write an equation to describe the cost (y) for up to 500 minutes.

$$y = 0.05x$$

b. What is the domain for the equation in letter (a)?

$$0 < x \leq 500$$

c. Write an equation to describe the cost (y) for talking 500 minutes to 1,000 minutes.

$$y = 0.10x$$

d. What is the domain for the equation in letter (c)?

$$500 < x \leq 1000$$

e. Write an equation to describe the cost (y) for talking more than 1,000 minutes.

$$y = 0.15x$$

f. What is the domain for the equation in letter (e)?

$$x > 1000$$

g. Write all the functions together as a set of piecewise functions.

$$y = \begin{cases} 0.05x, & 0 < x \leq 500 \\ 0.10x, & 500 < x \leq 1000 \\ 0.15x, & x > 1000 \end{cases}$$

h. How much would someone pay if they used 750 minutes?

$$y = 0.10(750) = \$75$$

i. How much would someone pay if they used 1,800 minutes?

$$y = 0.15(1800) = \$270$$