

Show ALL of your work!!!

Evaluate the function for the given value of x.

$$f(x) = \begin{cases} x+5, & \text{if } x \leq 3 \\ 2x-2, & \text{if } x > 3 \end{cases}$$

$$g(x) = \begin{cases} \frac{1}{2}x-4, & \text{if } x \leq -2 \\ 3-2x, & \text{if } x > -2 \end{cases}$$

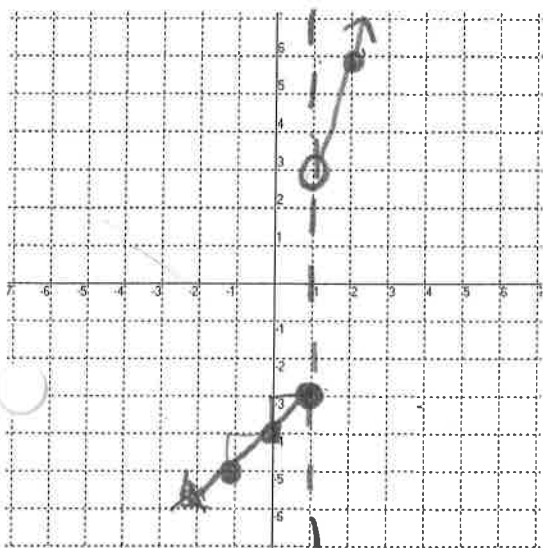
1. $f(7)$
 $f(7) = 2(7) - 2$
 $= 14 - 2$
 $= \boxed{12}$
2. $f(0)$
 $f(0) = 0 + 5$
 $= \boxed{5}$
3. $f(-1)$
 $f(-1) = -1 + 5$
 $= \boxed{4}$
4. $f(3)$
 $f(3) = 3 + 5$
 $= \boxed{8}$

5. $g(-4)$
 $g(-4) = \frac{1}{2}(-4) - 4$
 $= -2 - 4$
 $= \boxed{-6}$
6. $g(-2)$
 $g(-2) = \frac{1}{2}(-2) - 4$
 $= -1 - 4$
 $= \boxed{-5}$
7. $g(-1)$
 $g(-1) = 3 - 2(-1)$
 $= 3 + 2$
 $= \boxed{5}$
8. $g(6)$
 $g(6) = 3 - 2(6)$
 $= 3 - 12$
 $= \boxed{-9}$

Graph the following piecewise functions.

9. $f(x) = \begin{cases} x-4, & \text{if } x \leq 1 \\ 3x, & \text{if } x > 1 \end{cases}$

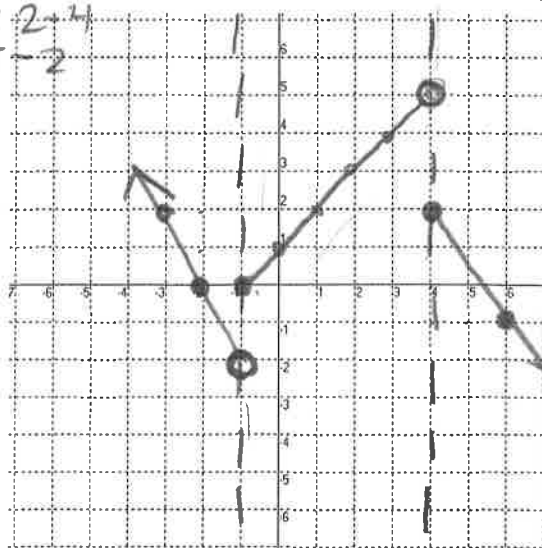
$f(1) = 1 - 4 = -3$
 $f(1) = 3(1) = 3$



10. $f(x) = \begin{cases} -2x-4, & \text{if } x < -1 \\ x+1, & \text{if } -1 < x < 4 \\ \frac{-3}{2}x+8, & \text{if } x \geq 4 \end{cases}$

$f(-1) = -1 + 1 = 0$
 $f(4) = 4 + 1 = 5$

$f(-1) = -2(-1) - 4 = 2 - 4 = -2$
 $f(4) = \frac{-3}{2}(4) + 8 = -6 + 8 = 2$



State whether the graph of the function a) opens up or down, b) identify the vertex, and c) tell whether the graph is *wider*, *narrower*, or the *same width* as $y = |x|$.

11. $y = |x - 3| - 5$

a) up

b) (3, -5)

c) Same width

12. $y = -4|x - 1| + 6$

a) down

b) (1, 6)

c) narrower

13. $y = \frac{1}{5}|x + 2| + 11$

a) up

b) (-2, 11)

c) wider

14. $y = -\frac{5}{2}|x - 1| - 3$

a) down

b) (1, -3)

c) narrower

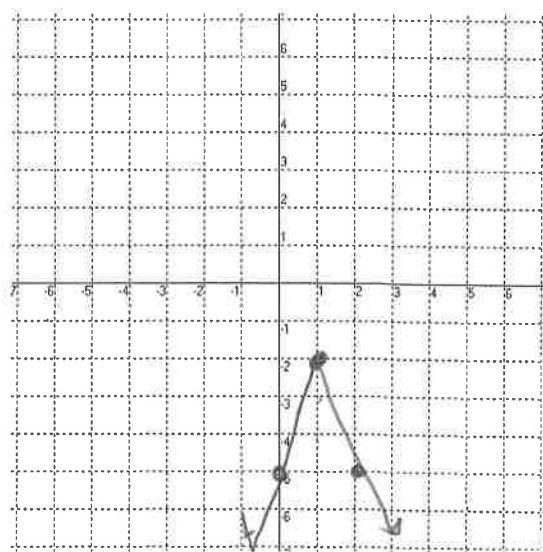
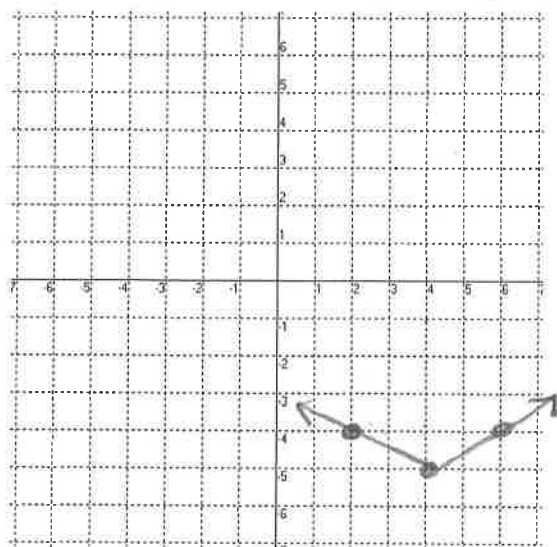
Graph the absolute value function.

15. $y = \frac{1}{2}|x - 4| - 5$

(4, -5)

16. $y = -3|x - 1| - 2$

(1, -2)



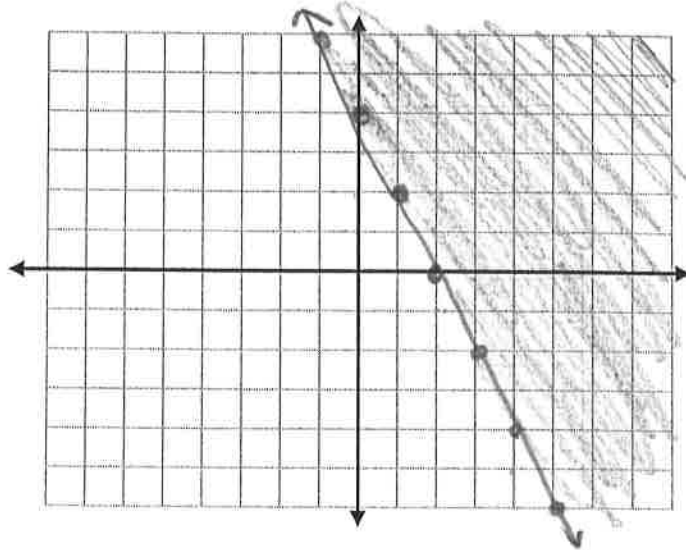
Graph each of the following on the given coordinate planes.

1) Graph $4x + 2y \geq 8$

$$\begin{aligned} 4(0) + 2y &= 8 \\ 2y &= 8 \\ y &= 4 \end{aligned}$$

$$\begin{aligned} 4x + 2(0) &= 8 \\ 4x &= 8 \\ x &= 2 \end{aligned}$$

$$m = \frac{-4}{2} = -2$$



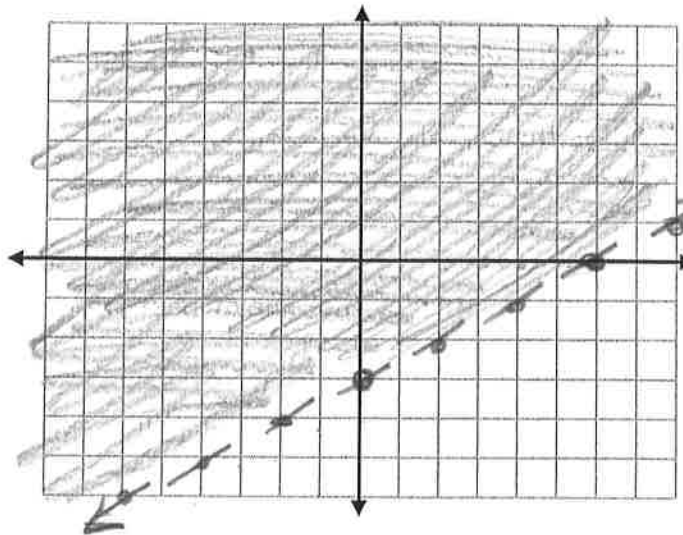
Test: $(0, 0)$
 $4(0) + 2(0) \geq 8$
 $0 \geq 8$
No.

2) Graph $x - 2y < 6$

$$\begin{aligned} 0 - 2y &= 6 \\ y &= -3 \end{aligned}$$

$$\begin{aligned} x - 2(0) &= 6 \\ x &= 6 \end{aligned}$$

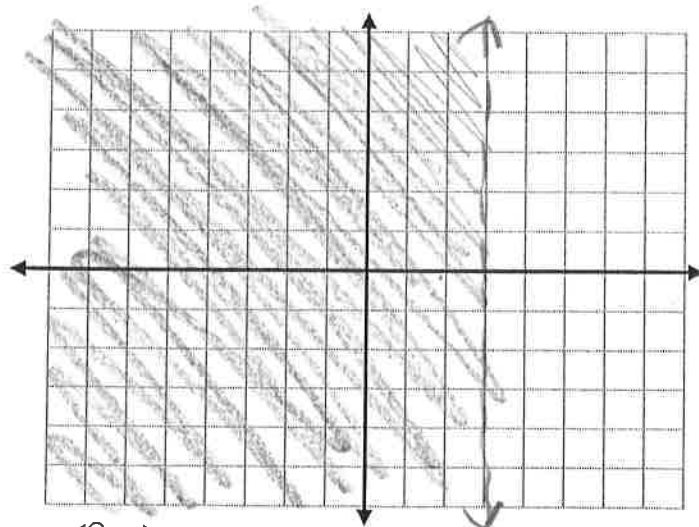
$$m = \frac{-1}{-2} = \frac{1}{2}$$



Test: $(0, 0)$
 $0 - 2(0) < 6$
 $0 < 6$
Yes.

2) Graph $x < 3$

$$x = 3 \text{ vertical}$$



Situation:

Different wind speeds and wind chill factors were recorded during a wind chill of 35° F. Graph the data on your graphics calculator and answer the questions below.

Wind Speed (mi/h)	Wind Chill Factor (°F)
5	33
10	22
15	16
20	12
25	8
30	6
35	4
40	3
45	2

7. What is the independent variable in this data? (2 pt.)

windspeed (mi/h)

8. What is the dependent variable in this data? (2 pt.)

wind chill factor

9. What is the correlation coefficient? Is it a strong or weak correlation? Why? (5 pts.)

$$r = -0.932$$

Yes, close to -1.

10. Write the equation of the "line of best fit." (5 pts.)

$$y = -0.703x + 29.361$$

11. Use the data to estimate the wind chill factor with the following wind speeds. (3 pts ea.)

a. 56

$$-10.03^{\circ}\text{F}$$

b. 64 °f

$$-15.65$$

(plug in to line of best fit or x value on calc table for exact value.)

12. Use the data to estimate the wind speed if the wind chill factor is -17° F. (3 pts.)

$$-17 = -0.703x + 29.361$$

$$x = 65.95 \text{ mi/hr.}$$