Math 101, Ch. 3 Practice Test Name_____

1. In which quadrant or axis does each of the following lie?

(a) (10, 5) Quadrant I

(b) (1, 0) *x*-axis

(c) (5, –1) Quadrant IV

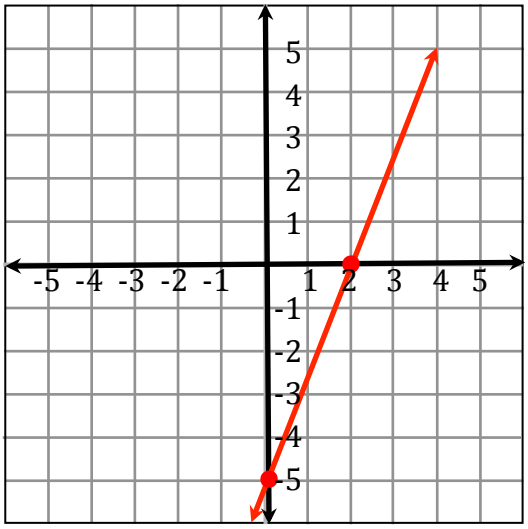
(d) (–2, –4) Quadrant III

2. State the *x*-intercept and *y*-intercept and use them to graph the equation

$5x - 2y = 10$

x-intercept: (2 , 0)

y-intercept: (0 , –5)



3. Solve for *y*, then complete the table of values for

$-6x + 3y = -3$

$+6x \qquad +6x$

$0 + 3y = 6x - 3$

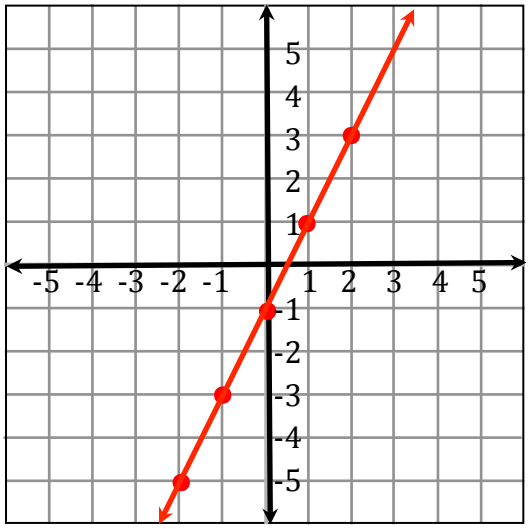
$\frac{3y}{3} = \frac{6x-3}{3}$

$y = \frac{6x}{3} - \frac{3}{3}$

$y = 2x - 1$

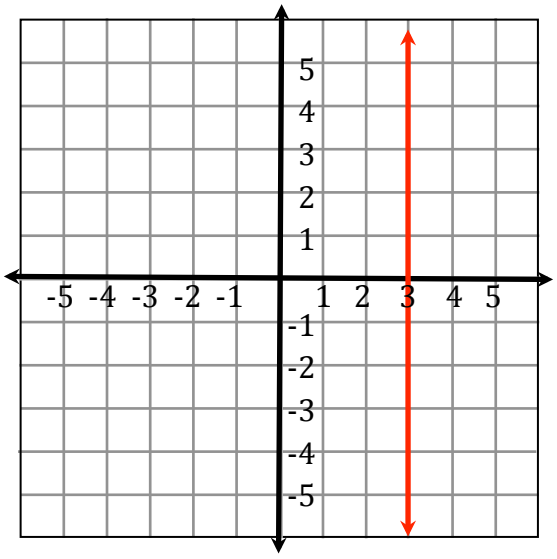
x	*y*
–2	$2(-2) - 1 = -4 - 1 = -5$
–1	$2(-1) - 1 = -2 - 1 = -3$
0	$2(0) - 1 = 0 - 1 = -1$
1	$2(1) - 1 = 2 - 1 = 1$
2	$2(2) - 1 = 4 - 1 = 3$

4. Use the table of values in #3 to graph the equation $-6x + 3y = -3$.



5. Graph

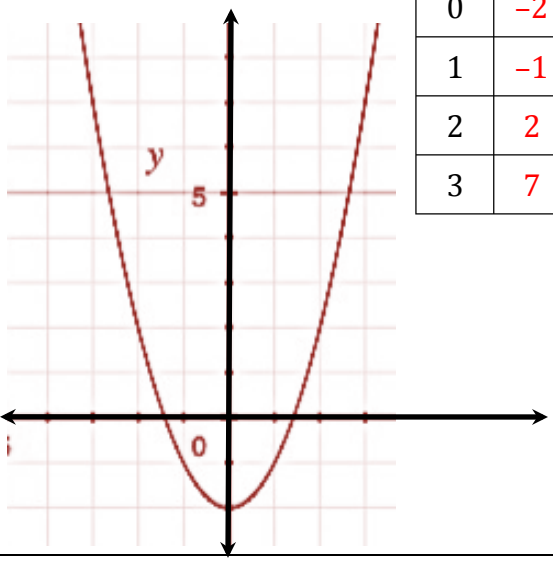
$x = 3$



6. Graph

$y = x^2 - 2$

x	y
–3	7
–2	2
–1	–1
0	–2
1	–1
2	2
3	7



7. Determine the slope and y-intercept of each equation

(a) $y = \frac{1}{3}x - 10$

$m = \frac{1}{3}$ and $b = -10$

(b) $y = -x + 2$

$m = -1$ and $b = 2$

8. Determine the slope and y-intercept of each equation

(a) $y = -\frac{3}{4}x$

$m = -\frac{3}{4}$ and $b = 0$

(b) $y = 5$

$m = 0$ and $b = 5$

9. (a) Determine the slope of the line that passes through the points

(x_1, y_1) and (x_2, y_2)

(a) (5, 4) and (4, 1)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1-4}{4-5} = \frac{1+(-4)}{4+(-5)} = \frac{-3}{-1} = 3$$

(x_1, y_1) and (x_2, y_2)

(b) (–3, –3) and (–2, –4)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4-(-3)}{-2-(-3)} = \frac{-4+3}{-2+3} = \frac{-1}{1} = -1$$

10. Are the following lines parallel, perpendicular or neither?

(a) $y = -3x + 4$
$y = 3x + 5$

Neither

(b) $y = \frac{3}{7}x + 4$

$y = -\frac{7}{3}x + 5$

Perpendicular

11. Are the following lines parallel, perpendicular or neither?

(a) $y = 4x + 4$
$y = 4x + 5$

Parallel

(b) $y = \frac{4}{5}x + 4$

$y = \frac{5}{4}x + 5$

Neither

12. (a) Determine the slope of the line with the following equation:

$x - 2y = 12$

$-x \qquad -x$

$0 - 2y = -x + 12$

$$\frac{-2y}{-2} = \frac{-x+12}{-2}$$

$$y = \frac{-x}{-2} + \frac{12}{-2}$$

$$y = \frac{1}{2}x - 6$$

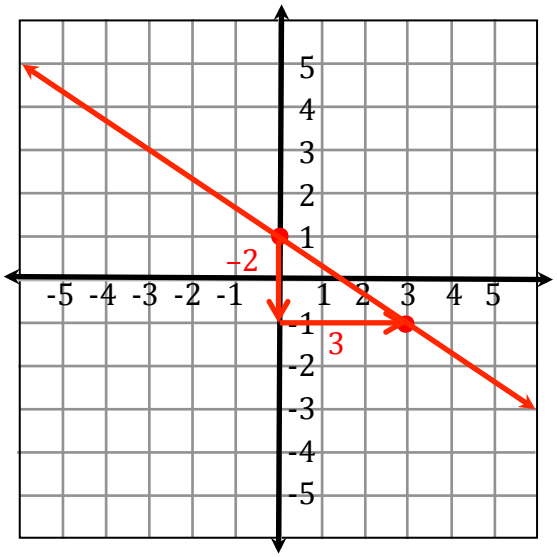
$$m = \frac{1}{2}$$

(b) What is the slope of a line perpendicular to the one above?

$$m_{\perp} = -2$$

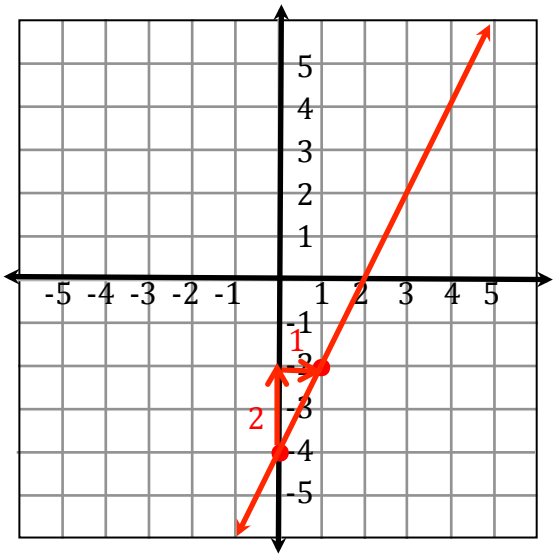
13. Use the slope and y-intercept to graph

$$y = -\frac{2}{3}x + 1$$



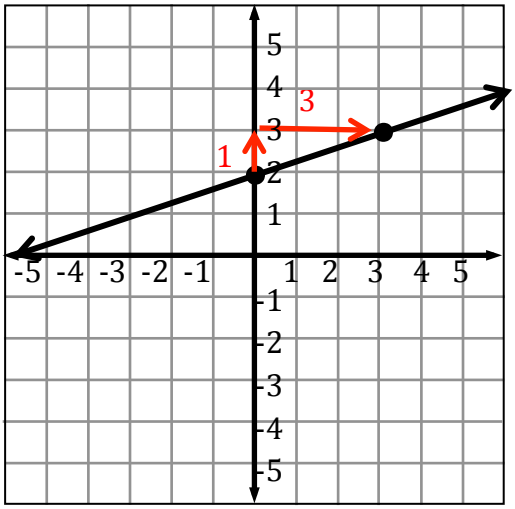
14. Use the slope and y-intercept to graph

$$y = 2x - 4$$



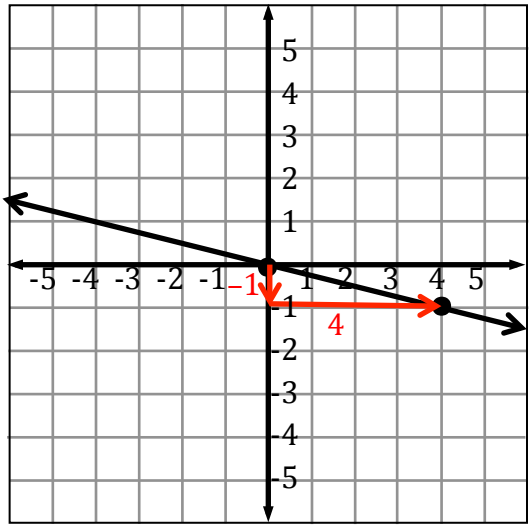
15. Write the equation in slope-intercept form ($y = mx + b$) of the line shown.

$$y = \frac{1}{3}x + 2$$



16. Write the equation in slope-intercept form ($y = mx + b$) of the line shown.

$$y = -\frac{1}{4}x$$



17. Write the equation in slope-intercept form ($y = mx + b$) of a line that has slope –5 and passes through (0, 1).

$y - y_1 = m(x - x_1)$
$y - 1 = -5(x - 0)$
$y - 1 = -5x + 0$
$+1 \quad +1$
$y + 0 = -5x + 1$
$y = -5x + 1$

18. Write the equation in slope-intercept form ($y = mx + b$) of a line that has slope $\frac{1}{4}$ and passes through (4, 5).

$y - y_1 = m(x - x_1)$
$y - 5 = \frac{1}{4}(x - 4)$
$y - 5 = \frac{1}{4}x - 1$
$+5 \quad +5$
$y + 0 = \frac{1}{4}x + 4$
$y = \frac{1}{4}x + 4$

19. Write the equation in slope-intercept form ($y = mx + b$) of the line that passes through

(x_1, y_1) and (x_2, y_2)
(–3, –5) and (0, 1)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1-(-5)}{0-(-3)} = \frac{1+5}{0+3} = \frac{6}{3} = 2$$

$y - y_1 = m(x - x_1)$
$y - (-5) = 2(x - (-3))$
$y + 5 = 2(x + 3)$
$y + 5 = 2x + 6$
$-5 \quad -5$
$y + 0 = 2x + 1$
$y = 2x + 1$

20. Write the equation in slope-intercept form ($y = mx + b$) of the line that passes through

(x_1, y_1) and (x_2, y_2)
(4, –2) and (0, –2)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2-(-2)}{0-4} = \frac{-2+2}{-4} = \frac{0}{-4} = 0$$

$y - y_1 = m(x - x_1)$
$y - (-2) = 0(x - 4)$
$y + 2 = 0$
$-2 \quad -2$
$y + 0 = -2$
$y = -2$

21. Write the equation in slope-intercept form ($y = mx + b$) of the line that passes through (6, 1) and is parallel to

$-6x + 3y = 12$

$+6x \qquad +6x$

$0 + 3y = 6x + 12$

$\frac{3y}{3} = \frac{6x+12}{3}$

$y = \frac{6x}{3} + \frac{12}{3}$

$y = 2x + 4$

$m = 2$

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

$y - 1 = 2(x - 6)$

$y - 1 = 2x - 12$

$+1 \qquad +1$

$y + 0 = 2x - 11$

$y = 2x - 11$

22. Write the equation in slope-intercept form ($y = mx + b$) of the line that passes through (6, 1) and is perpendicular to

$-6x + 3y = 12$

$+6x \qquad +6x$

$0 + 3y = 6x + 12$

$\frac{3y}{3} = \frac{6x+12}{3}$

$y = \frac{6x}{3} + \frac{12}{3}$

$y = 2x + 4$

$m = 2$ and $m_{\perp} = -\frac{1}{2}$

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

$y - 1 = -\frac{1}{2}(x - 6)$

$y - 1 = -\frac{1}{2}x + 3$

$+1 \qquad +1$

$y + 0 = -\frac{1}{2}x + 4$

$y = -\frac{1}{2}x + 4$

23. Determine if the following mappings are functions or not.

(a) $x \longrightarrow y$

$0 \longrightarrow -4$

$3 \searrow$

$\qquad -2$

$5 \nearrow$

Yes. This is a function.

Every x-value is paired with exactly one y-value.

(b) $x \longrightarrow y$

$1 \nearrow 1$

$1 \searrow 3$

$2 \longrightarrow 5$

No. This is not a function.

$x = 1$ is mapped to $y = 1$ and $y = 3$.

24.

(a) For $f(x) = 2x + 3$, find $f(4)$.

$f(4) = 2 \bullet 4 + 3$

$f(4) = 8 + 3$

$f(4) = 11$

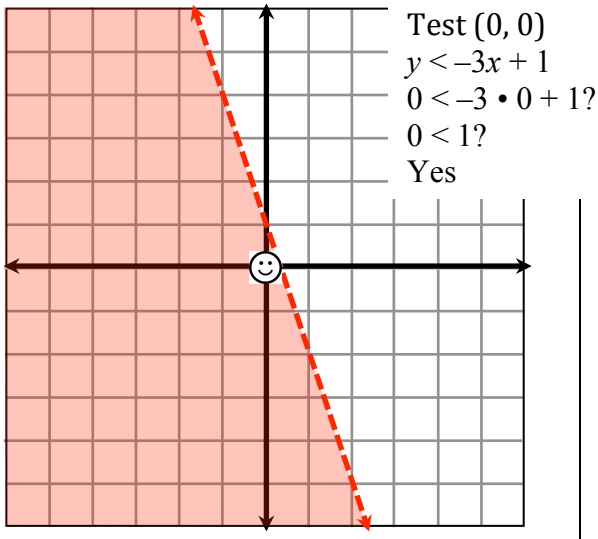
(b) For $f(x) = (x - 1)^2$, find $f(-5)$.

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

$f(-5) = (-6)^2$

$f(-5) = 36$

25. (a) Graph $y < -3x + 1$



(b) Graph $y \geq 1$