Test 2 Practice Test – Answer Key

1) Is $(5,-2)$ a solution to $4x-2y=16$?

Strategy: Substitute the values for x and y.
If the equation is true, the ordered pair is a solution.
If the equation is false, the ordered pair is not a solution.

Work

$$4x-2y=16$$
$$4(5)-2(-2)=16$$
$$20+4=16$$
$$24=16$$

Since this equation is false, the ordered pair is **not** a solution.

2) Find the *x*- and *y*-intercept for $2x-8y=-40$.

Strategy: To find the x-intercept, substitute 0 for y and solve for x.
To find the y-intercept, substitute 0 for x and solve for y.

Work

x-intercept	*y*-intercept
$2x-8y=-40$	$2x-8y=-40$
$2x-8(0)=-40$	$2(0)-8y=-40$
$2x=-40$	$-8y=-40$
$x=-20$	$y=5$
$(-20,0)$	$(0,5)$

3) Find the *x*- and *y*-intercept for $y=-4x+10$.

Strategy: To find the x-intercept, substitute 0 for y and solve for x.
To find the y-intercept, substitute 0 for x and solve for y.

Work

x-intercept	*y*-intercept
$y=-4x+10$	$y=-4x+10$
$0=-4x+10$	$y=-4(0)+10$
$4x=10$	$y=10$
$x=\frac{10}{4}$	
$x=\frac{5}{2}$	
$\left(\frac{5}{2},0\right)$	$(0,10)$

4) Find the slope of a line that passes through $(-5,3)$ and $(-3,9)$.

Strategy: To find the slope of a line that passes through two points, use the slope formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$.

Remember that subtracting a negative number can be rewritten as an addition problem.

Work

$$m = \frac{9-3}{-3-(-5)} = \frac{9-3}{-3+5} = \frac{6}{2} = 3$$

5) Find the slope of a line that passes through $(6,-2)$ and $(3,10)$.

Strategy: To find the slope of a line that passes through two points, use the slope formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$.

Remember that subtracting a negative number can be rewritten as an addition problem.

Work

$$m = \frac{10-(-2)}{3-6} = \frac{10+2}{3-6} = \frac{12}{-3} = -4$$

6) Find the slope and *y*-intercept of the line $y = -2x + 7$.

Strategy: Be sure that the equation is written in $y = mx + b$ *form. If it is not, solve the equation for y first.*

The slope is m, and the y-intercept is $(0,b)$.

Work

This equation is in $y = mx + b$ form, so the slope is -2 and the *y*-intercept is $(0,7)$.

7) Find the slope and *y*-intercept of the line $5x + 3y = 18$.

Strategy: Be sure that the equation is written in $y = mx + b$ *form. If it is not, solve the equation for y first.*

The slope is m, and the y-intercept is $(0,b)$.

Work

Start by solving the equation for *y*.

$$5x + 3y = 18$$

$$3y = -5x + 18$$

$$\frac{3y}{3} = \frac{-5x}{3} + \frac{18}{3}$$

$$y = -\frac{5}{3}x + 6$$

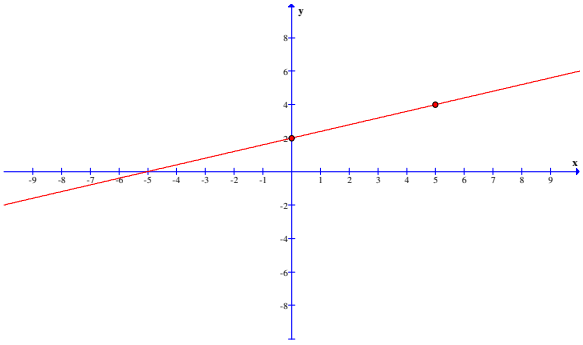
This equation is now in $y = mx + b$ form, so the slope is $-\frac{5}{3}$ and the *y*-intercept is $(0,6)$.

8) Graph $y = \frac{2}{5}x + 2$

Strategy: If the equation is in $y = mx + b$ form, start by plotting a point at the y-intercept $(0, b)$. Next use the slope to find a second point on the line. Finish by drawing a line through those two points.

Work

The *y*-intercept is $(0, 2)$. The slope is $\frac{2}{5}$, so move up 2 units and 5 units to the right.

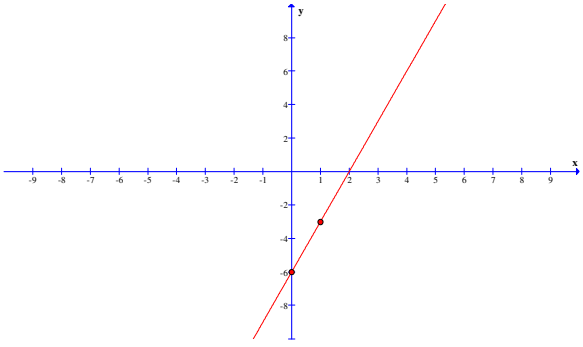


9) Graph $y = 3x - 6$

Strategy: If the equation is in $y = mx + b$ form, start by plotting a point at the y-intercept $(0, b)$. Next use the slope to find a second point on the line. Finish by drawing a line through those two points.

Work

The *y*-intercept is $(0, 6)$. The slope is 3, so move up 3 units and 1 unit to the right.



10) Graph $-3x+2y=12$.

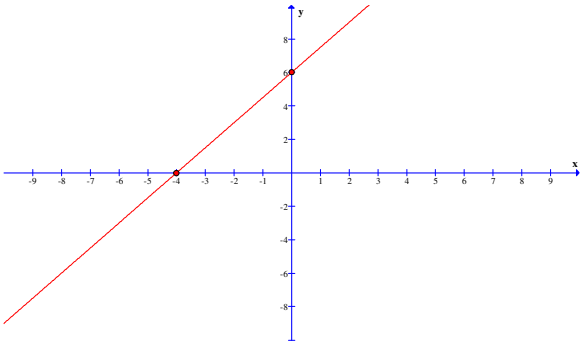
Strategy: If the equation is not in $y=mx+b$ form, begin by finding the x- and y-intercepts.
To find the x-intercept, substitute 0 for y and solve for x.
To find the y-intercept, substitute 0 for x and solve for y.
Plot the two intercepts and draw the line that passes through them.

Work

x-intercept	y-intercept
$-3x+2y=12$	$-3x+2y=12$
$-3x+2(0)=12$	$-3(0)+2y=12$
$-3x=12$	$2y=12$
$x=-4$	$y=6$
$(-4,0)$	$(0,6)$

Plot the x-intercept at $(-4,0)$ and the y-intercept at $(0,6)$.

Draw the line through these two points.



11) Graph $y = -4$.

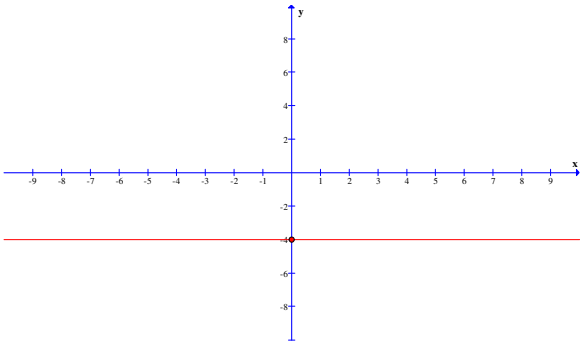
Strategy: If the equation only has one variable, it is either a vertical or horizontal line.
Vertical: $x = \#$.
Horizontal: $y = \#$.
Plot the intercept and draw the appropriate line that passes through it.

Work

This line is horizontal.

Plot the *y*-intercept at $(0,-4)$.

Draw the horizontal line through this point.



12) Evaluate. $f(x) = 9x + 7$, $f(-2)$

Strategy: Substitute the number or expression that is inside the parentheses for x and simplify.

Work

$$f(x) = 9x + 7$$
$$f(-2) = 9(-2) + 7$$
$$= -18 + 7$$
$$= -11$$

13) Evaluate. $f(x) = 3x + 7$, $f(5a - 1)$

Strategy: Substitute the number or expression that is inside the parentheses for x and simplify.

Work

$$f(x) = 3x + 7$$
$$f(5a - 1) = 3(5a - 1) + 7$$
$$= 15a - 3 + 7$$
$$= 15a + 4$$

14) Find the equation of a line with a slope of -5 and *y*-intercept $(0,-3)$.

Strategy: To find the equation of a line, find the slope m and y-intercept $(0,b)$.

Substitute the values for m and b into $y = mx + b$.

Work

In this problem we know that $m = -5$ and $b = -3$.

The equation is $y = -5x - 3$.

15) Find the equation of a line with a slope of $-\frac{3}{2}$ that passes through $(-4,9)$.

Strategy: To find the equation of a line, find the slope m and y-intercept $(0,b)$.

If given the slope and a point on the line, substitute for m, x, and y in the equation $y = mx + b$ *and solve for b.*

Substitute the values for m and b into $y = mx + b$.

Work

Substitute $-\frac{3}{2}$ for *m*, -4 for *x*, and 9 for *y*. Solve for *b*.

$$y = mx + b$$

$$9 = -\frac{3}{2}(-4) + b$$

$$9 = 6 + b$$

$$9 - 6 = b$$

$$3 = b$$

The equation is $y = -\frac{3}{2}x + 3$.

16) Find the equation of a line that passes through $(-2,1)$ and $(2,7)$.

Strategy: To find the equation of a line, find the slope m and y-intercept $(0,b)$.

If given two points on the line, find the slope using the slope formula $m=\frac{y_2-y_1}{x_2-x_1}$.

Next, using either of the two given points, substitute for m, x, and y in the equation $y=mx+b$ *and solve for b.*

Substitute the values for m and b into $y=mx+b$.

Work

$$m=\frac{7-1}{2-(-2)}=\frac{7-1}{2+2}=\frac{6}{4}=\frac{3}{2}$$

Substitute $\frac{3}{2}$ for m, -2 for x, and 1 for y. Solve for b.

$$y=mx+b$$
$$1=\frac{3}{2}(-2)+b$$
$$1=3+b$$
$$1-3=b$$
$$-2=b$$

The equation is $y=\frac{3}{2}x-2$.

17) What type of line, horizontal or vertical, has a slope of 0?

Strategy: Horizontal lines have a slope of 0. Vertical lines have undefined slope.

Work

A **horizontal** line has a slope of 0.

18) Are the lines $12x-9y=17$ and $-8x+6y=10$ parallel, perpendicular, or neither?

Strategy: Begin by finding the slope of each line.
If the lines are not in $y=mx+b$ form, solve for y to find the slope.
If the two lines have the same slope, they are parallel.
The two lines are perpendicular if their slopes are negative reciprocals.

Work

$12x-9y=17$	$-8x+6y=10$
$12x-9y=17$ $-9y=-12x+17$ $\frac{-9}{-9}y=\frac{-12}{-9}x+\frac{17}{-9}$ $y=\frac{4}{3}x-\frac{17}{9}$	$-8x+6y=10$ $6y=8x+10$ $\frac{6}{6}y=\frac{8}{6}x+\frac{10}{6}$ $y=\frac{4}{3}x+\frac{5}{3}$
$m=\frac{4}{3}$	$m=\frac{4}{3}$

Since the two slopes are equal, the lines are **parallel**.

19) Graph $2x+7y \geq 14$.

Strategy: Graph the line using its intercepts or using its slope and y-intercept. Determine whether the line should be solid or dashed.

Pick a test point not on the line, ideally the origin $(0,0)$.

If the inequality is true, shade the side of the line containing the test point. If the inequality is false, shade the other side of the line.

Work

This line should be graphed as a solid line because of the $\geq$ sign.

Graph using the intercepts.

x-intercept	y-intercept
$2x+7y=14$	$2x+7y=14$
$2x+7(0)=14$	$2(0)+7y=14$
$2x=14$	$7y=14$
$x=7$	$y=2$
$(7,0)$	$(0,2)$

Test Point: $(0,0)$

$$2x+7y \geq 14$$
$$2(0)+7(0) \geq 14$$
$$0 \geq 14$$

False, so shade the side of the line not containing the test point.