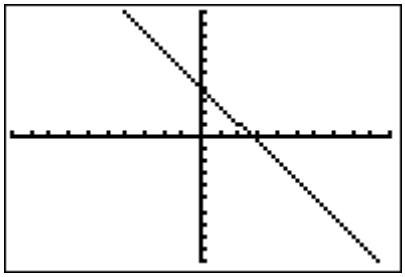
Elementary Algebra
Chapter 3 Test Review

1. Graph:

$y = \frac{-3}{2}x + 4$



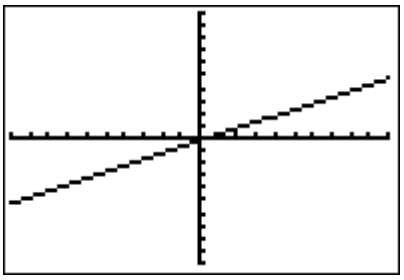
$6x - 12y = 3$

$6x - 12y = 3$

$6x - 3 = 12y$

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

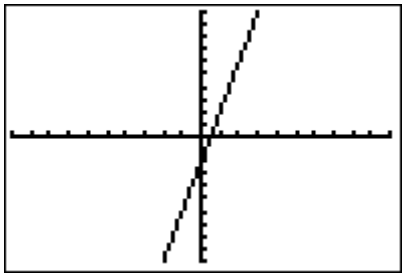
$\frac{1}{2}x - \frac{1}{4} = y$



$4x - y = 2$

$4x - y = 2$

$4x - 2 = y$



$\frac{1}{3}x - \frac{1}{4}y = \frac{1}{6}$

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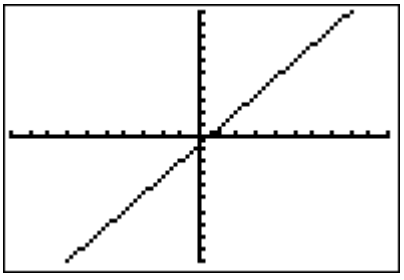
$12\left(\frac{1}{3}x\right) - 12\left(\frac{1}{4}y\right) = 12\left(\frac{1}{6}\right)$

$4x - 3y = 2$

$4x - 2 = 3y$

$\frac{4}{3}x - \frac{2}{3} = \frac{3}{3}y$

$\frac{4}{3}x - \frac{2}{3} = y$



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2. Find the intercepts of:

$24x - 6y = 8$

x-intercept: plug zero in for y

$24x - 6y = 8$

$24x - 6(0) = 8$

$24x = 8$

$\frac{24x}{24} = \frac{8}{24}$

$x = \frac{1}{3}$

$\left(\frac{1}{3}, 0\right)$

y-intercept: plug zero in for x

$24x - 6y = 8$

$24(0) - 6y = 8$

$-6y = 8$

$\frac{-6y}{-6} = \frac{8}{-6}$

$y = \frac{-4}{3}$

$\left(0, \frac{-4}{3}\right)$

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

x-intercept: plug zero in for y

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

$\frac{1}{5}x - 2(0) = 3$

$\frac{1}{5}x = 3$

$5\left(\frac{1}{5}x\right) = 5(3)$

$x = 15$

$(15, 0)$

y-intercept: plug zero in for x

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

$\frac{1}{5}(0) - 2y = 3$

$-2y = 3$

$\frac{-2y}{-2} = \frac{3}{-2}$

$y = \frac{-3}{2}$

$\left(0, \frac{-3}{2}\right)$

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3. Find the slope of the line that passes through the points (-5, -2) and (8, -9)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$m = \frac{(-9) - (-2)}{(8) - (-5)}$$
$$m = \frac{-9 + 2}{8 + 5}$$
$$m = \frac{-7}{13}$$

4. Find the equation of the line that has slope of 5 and passes through the point (3, 7)

1st: Find m

m = 5

2nd: Plug in given point for x, y and m from step 1 into y=mx+b and solve for b

$$y = mx + b$$
$$7 = 5(3) + b$$
$$7 = 15 + b$$
$$7 - 15 = b$$
$$-8 = b$$

3rd: Write down the answer

y = mx + b

y = 5x - 8

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5. Find the equation of the line that passes through the points:

(1, 3) and (4, 9)

1st: Find m

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$m = \frac{(9) - (3)}{(4) - (1)}$$
$$m = \frac{6}{3}$$
$$m = 2$$

2nd: Plug in either point for x, y and m from step 1 into y=mx+b and solve for b:

$$y = mx + b$$
$$3 = 2(1) + b$$
$$3 = 2 + b$$
$$3 - 2 = b$$
$$1 = b$$

3rd: Write answer

$$y = mx + b$$
$$y = 2x + 1$$

(-3, -5) and (2, -8)

1st: Find m

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$m = \frac{(-8) - (-5)}{(2) - (-3)}$$
$$m = \frac{-8 + 5}{2 + 3}$$
$$m = \frac{-3}{5}$$

2nd: Plug in either point for x, y and m from step 1 into y=mx+b and solve for b:

$$y = mx + b$$
$$-8 = \frac{-3}{5}(2) + b$$
$$-8 = \frac{-6}{5} + b$$
$$-8 + \frac{6}{5} = b$$
$$\frac{-34}{5} = b$$

3rd: Write answer

$$y = mx + b$$
$$y = \frac{-3}{5}x - \frac{34}{5}$$

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6. Given a point and a line that it is parallel to, find the equation of the line:

Find the equation of the line that is parallel to $4x-3y=6$ and passes through the point: (5, 2)

1st: Find m

a) Write given line in slope intercept form:

$$4x-3y=6$$
$$4x-6=3y$$
$$\frac{4}{3}x-\frac{6}{3}=\frac{3}{3}y$$
$$\frac{4}{3}x-2=y$$

b) Identify the slope

$$slope \quad is \quad \frac{4}{3}$$

c) Parallel lines have same slopes so:

$$m=\frac{4}{3}$$

2nd: Plug in given point for x, y and m from step 1 into y=mx+b and solve for b

$$y=mx+b$$
$$2=\frac{4}{3}(5)+b$$
$$2=\frac{20}{3}+b$$
$$2-\frac{20}{3}=b$$
$$\frac{-14}{3}=b$$

3rd: Write answer

$$y=\frac{4}{3}x-\frac{14}{3}$$

Find the equation of the line that is parallel to $y=7x-2$ and passes through the point: (3, -1)

1st: Find m

a) Write given line in slope intercept form:

$$y=7x-2$$

b) Identify the slope

$$slope \quad is \quad 7$$

c) Parallel lines have same slopes so:

$$m=7$$

2nd: Plug in given point for x, y and m from step 1 into y=mx+b and solve for b

$$y=mx+b$$
$$-1=7(3)+b$$
$$-1=21+b$$
$$-1-21=b$$
$$-22=b$$

3rd: Write answer

$$y=7x-22$$

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7. Given a point and a line that it is perpendicular to, find the equation of the line:

Find the equation of the line that is perpendicular to $y = \frac{-1}{6}x - 3$ and passes through the point (3, 4)

1st: Find m

a) Write given line in slope intercept form:

$$y = \frac{-1}{6}x - 3$$

b) Identify the slope

$$slope \quad is \quad \frac{-1}{6}$$

c) Perpendicular lines have slopes that are negative reciprocals so:

$$m = 6$$

2nd: Plug in given point for x, y and m from step 1 into y=mx+b and solve for b

$$y = mx + b$$
$$4 = 6(3) + b$$
$$4 = 18 + b$$
$$4 - 18 = b$$
$$-14 = b$$

3rd: Write answer

$$y = 6x - 14$$

Find the equation of the line that is perpendicular to $5x - 4y = 8$ and passes through the point (-1, -2)

1st: Find m

a) Write given line in slope intercept form:

$$5x - 4y = 8$$
$$5x - 8 = 4y$$
$$\frac{5}{4}x - \frac{8}{4} = \frac{4y}{4}$$
$$\frac{5}{4}x - 2 = y$$

b) Identify the slope

$$slope \quad is \quad \frac{5}{4}$$

c) Perpendicular lines have slopes that are negative reciprocals so:

$$m = \frac{-4}{5}$$

2nd: Plug in given point for x, y and m from step 1 into y=mx+b and solve for b

$$y = mx + b$$
$$-2 = \frac{-4}{5}(-1) + b$$
$$-2 = \frac{4}{5} + b$$
$$-2 - \frac{4}{5} = b$$
$$\frac{-14}{5} = b$$

3rd: Write answer

$$y = \frac{-4}{5}x - \frac{14}{5}$$