

Pre-Calculus
Basic Math Skills

Key

Formulas:

Standard form: $Ax + By = C$

Point-Slope: $y - y_1 = m(x - x_1)$

Slope-Intercept: $y = mx + b$

Slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Sketch each of the following equations on the graph below. Each line should include at least two points and have arrows on each end. Label each line with its problem number.

1) $y = \frac{7}{5}x - 4$ $m = \frac{7}{5}$ y -int $(0, -4)$

2) $y = -\frac{5}{2}x$ $m = -\frac{5}{2}$ y -int $(0, 0)$

3) $y = 2$ $m = 0$ y -int $(0, 2)$

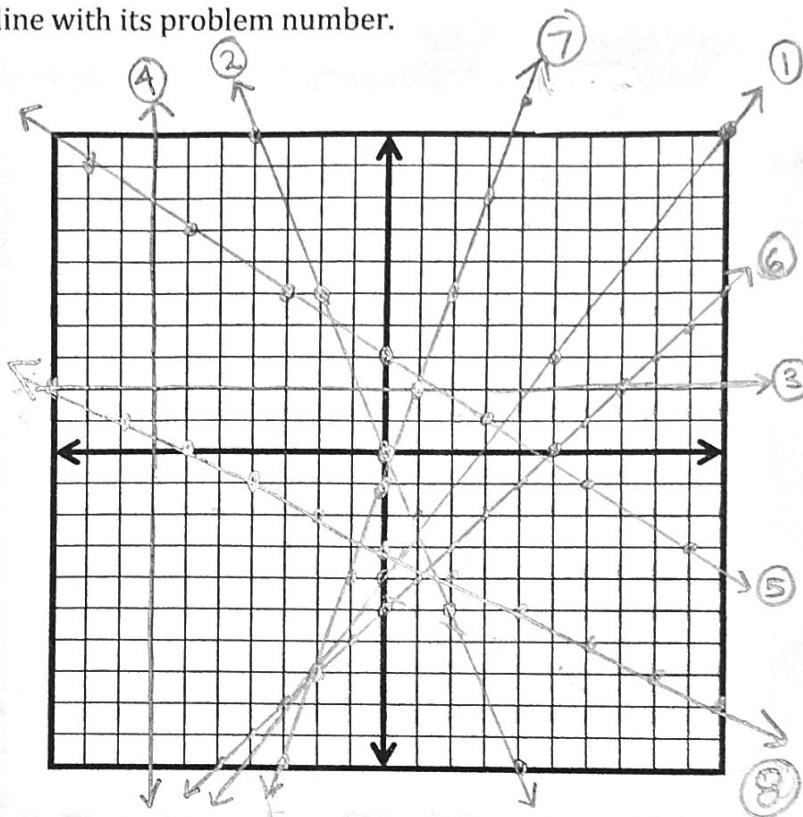
4) $x = -7$ slope is undefined

5) $2x + 3y = 9 \rightarrow 3y = -2x + 9$
 $y = -\frac{2}{3}x + 3$

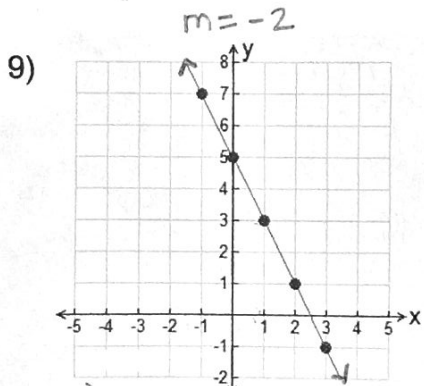
6) $x - y = 5$
 x -int $(5, 0)$ y -int $(0, -5)$

7) $y - 2 = 3(x - 1)$
point $(1, 2)$ $m = 3$

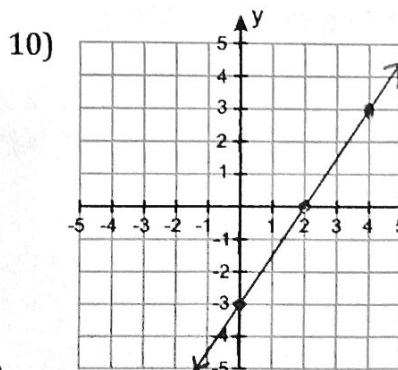
8) $y + 1 = -\frac{1}{2}(x + 4)$
point $(-4, -1)$ $m = -\frac{1}{2}$



Write the equation of each line in a) point slope form, b) slope-intercept and c) standard form.



- a) answers may vary
 a) $y - 7 = -2(x + 1)$
 $y - 5 = -2x$
 $y - 3 = -2(x - 1)$
 $y - 2 = -2(x - 2)$
 $y + 1 = -2(x - 3)$
- b) $y = -2x + 5$
- c) $2x + y = 5$



- a) answers may vary
 $y + 3 = \frac{3}{2}x$
 $y = \frac{3}{2}(x - 2)$
 $y - 3 = \frac{3}{2}(x - 3)$
- b) $y = \frac{3}{2}x - 3$
- $-\frac{3}{2}x + y = -3$
- c) $3x - 2y = 6$

Write the equation of each line described in a) point-slope form, b) slope-intercept and c) standard form.

11) contains (3, -5) with slope of $-\frac{7}{3}$

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

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

$$\frac{7}{3}y = -\frac{7}{3}x + 2$$

b) $y = -\frac{7}{3}x + 2$

$$\frac{7}{3}x + y = 2$$

c) $7x + 3y = 6$

12) contains (-4, 3) parallel to $y = -\frac{5}{4}x + 1$ Parallel lines have same slopes

a) $y - 3 = -\frac{5}{4}(x + 4)$

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

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

c) $5x + 4y = -8$

$$y - 3 = -\frac{5}{4}x - 5$$

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

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

13) passes through (1, 0) perpendicular to $y = -3x - 7$ Slopes of perpendicular lines are opposite reciprocals.

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

b) $y = \frac{1}{3}x - \frac{1}{3}$

c) $x - 3y = 1$

14) contains (0, -2) and (-3, -5)

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

$$m = \frac{-2 + 5}{0 + 3} = \frac{3}{3} = 1$$

a) $y + 2 = 1(x - 0)$

$$y + 2 = x$$

or

$$y + 5 = 1(x + 3)$$

b) $y = x - 2$

$$-x + y = -2$$

c) $x - y = 2$

15) passes through (1, -1) and (5, 2)

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

a) $y + 1 = \frac{3}{4}(x - 1)$

or

$$y - 2 = \frac{3}{4}(x - 5)$$

b) $y + 1 = \frac{3}{4}(x - 1)$

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

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

$$y = \frac{3}{4}x - \frac{7}{4}$$

c) $-\frac{3}{4}x + y = -\frac{7}{4}$

$$3x - 4y = 7$$

16) slope is undefined and passes through (8, -4)

$$x = 8$$