Readiness Standards A.5C, A.6B

Supporting Standards A.6A A.6D A.6E

RC: 3

Name: Key

Slope Review

Find the value of x and y so that the line through the points has the given slope:

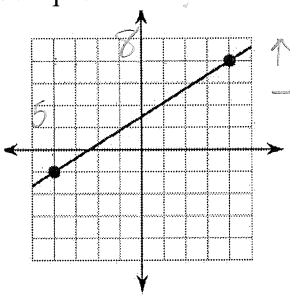
Ex.1) $(x, -4)$ and $(-3, 9)$; slope: $\frac{13}{4} = \frac{\Delta y}{\Delta x}$

$\frac{9-(-4)}{-3-x} = \frac{13}{4} = \frac{13}{-3-x}$ $\quad -3-x=4$, $+3\ +3$, $-x=7$, $x=-7$

Ex. 2) $(8, -5)$ and $(6, y)$; slope: -5

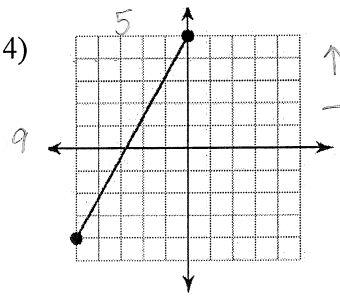
Find the slope:

Ex. 3)



$\uparrow 5\ +5$, $\rightarrow 8\ +8$, $m = \frac{5}{8}$

Ex. 4)



$\uparrow 9\ +9$, $\rightarrow 5\ +5$, $m = \frac{9}{5}$

Ex. 5) (0, -8), (-2, -2)

$m = \frac{\Delta y}{\Delta x} = \frac{-2-(-8)}{-2-0} = \frac{6}{-2} = -3$, $m = -3$

Ex. 6) (-4, 20), (-11, -19)

$m = \frac{\Delta y}{\Delta x} = \frac{20-(-19)}{-4+(+11)} = \frac{39}{7}$, $m = \frac{39}{7}$

Ex. 7) $y = -x - 3$

$m = -1$

Ex. 8) $y + \frac{1}{5}x = 2$

$-\frac{1}{5}x \quad -\frac{1}{5}x$

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

$m = -\frac{1}{5}$

Ex. 9) Find the slope of the line that is parallel to the line $y = 5x - 7$. same slope

$m = 5$

Ex. 10) Find the slope of the line that is perpendicular to the line $y = -\frac{4}{5}x + 2$. $m = -\frac{4}{5}$, $+\frac{5}{4}$

m = negative reciprocal

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

Write an equation for a line with the following information.

Ex. 11) Through points (1,-8) and (4,-14)

$m = \frac{\Delta y}{\Delta x} = \frac{-14+(+8)}{4-1} = \frac{-6}{3} = -2$

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

$y-(-14) = -2(x-4)$

$y+14 = -2x+8$, $-14\ -14$

$y = -2x - 6$

Ex. 12) Slope $= \frac{3}{5}$ through point (20,-9)

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

$y-(-9) = \frac{3}{5}(x-20)$ $\quad -\frac{60}{5} = -12$

$y+9 = \frac{3}{5}x - 12$

$-9 \quad -9$

$y = \frac{3}{5}x - 21$

Ex. 13) Perpendicular to $y = -\frac{7}{2}x + 5$, with a y-intercept of -9.

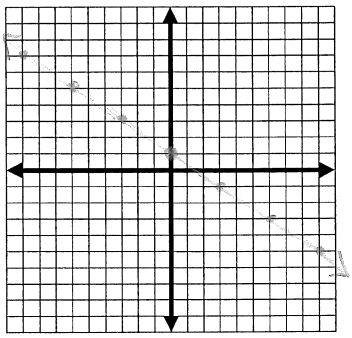
(0,-9) $\quad m = -\frac{7}{2}$

$m_\perp = +\frac{2}{7}$

$y = \frac{2}{7}x - 9$

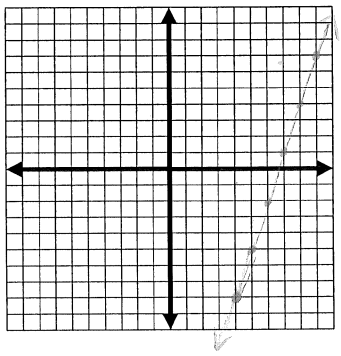
HOMEWORK:

1) Write the equation for the line in the graph.



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

2) Write the equation for the line in the graph.



$y = 3x - 20$

Write an equation for a line with the following information.

3) Through points (-2,-5) and (1,-11)

$m = \frac{\Delta y}{\Delta x} = \frac{-11-(-5)}{1-(-2)} = \frac{-6}{3} = -2$

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

$y - (-11) = -2(x - 1)$

$y + 11 = -2x + 2$

$-11 \quad -11$

$y = -2x - 9$

4) Slope = $\frac{2}{5}$ through point (10,-9)

$y - (-9) = \frac{2}{5}(x - 10)$ $\quad \frac{2}{5}(-10) = \frac{-20}{5} = -4$

$y + 9 = \frac{2}{5}x - 4$

$-9 \quad -9$

$y = \frac{2}{5}x - 13$

5) Perpendicular to $y = -\frac{4}{3}x + 6$, with a y-intercept of -10.

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

$m_\perp = +\frac{3}{4}$

$m = \frac{3}{4}$ $\quad y$ int $(0,-10)$

$y = \frac{3}{4}x - 10$

x	y
-10	6
-5	3
5	-3
15	-9

Δx: +5, +10, +10 $\quad \Delta y$: -3, -6, -6

6) Find the linear equation for the table above.

$m = \frac{\Delta y}{\Delta x} = \frac{-3}{5} = \frac{-6}{10} = \frac{-6}{10}$

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

$y - (-3) = -\frac{3}{5}(x - 5)$ $\quad -\frac{3}{5}(-5) = +\frac{15}{3} = 3$

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

$-3 \quad -3$

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

7) Find the equation of a line parallel to line $2x - 5y = 6$ with a y-intercept of 7. (same slope)

$-2x \quad -2x$

$\frac{-5y}{-5} = \frac{-2x}{-5} + \frac{6}{-5}$

$y = \frac{2}{5}x - \frac{6}{5}$

$y = \frac{2}{5}x + 7$

$m = \frac{2}{5}$

y-int $(0,7)$

8) Write an equation of a line that contains the given point and is parallel to the given line. (same slope)

$(6,4)$; $-7x + 3y = 9$

$+7x \quad +7x$

$\frac{3y}{3} = \frac{7x}{3} + \frac{9}{3}$

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

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

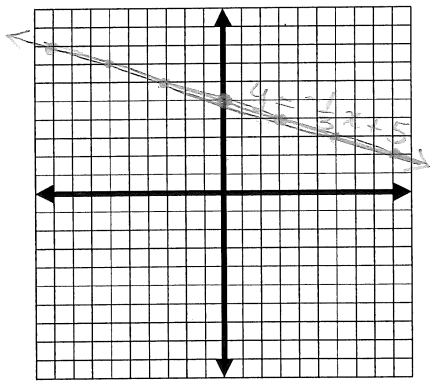
$y - 4 = \frac{7}{3}(x - 6)$ $\quad \frac{7}{3}(-6) = -\frac{42}{3}$

$y - 4 = \frac{7}{3}x - 14$

$+4 \quad +4$

$y = \frac{7}{3}x - 10$

9) Graph: $y = -\frac{1}{3}x + 5$

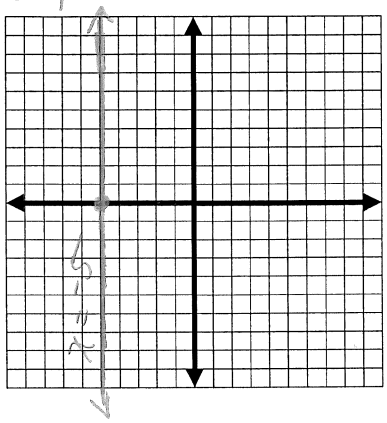


y-int $(0,5)$

$m = -\frac{1}{3}$ $\quad \downarrow 1$ $\quad \rightarrow 3$

10) Graph: $x = -5$

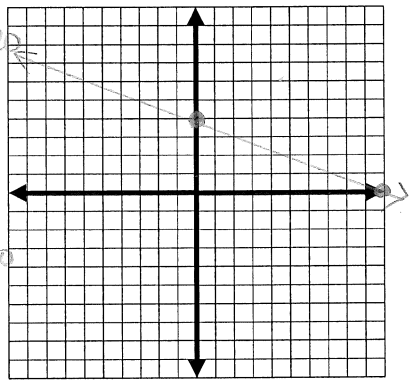
10) Graph $x = -5$



H
O
y

{ Vertical line
Undefined Slope
$x = -5$

11) Find the x- and y-intercepts and graph:
$2x + 5y = 20$



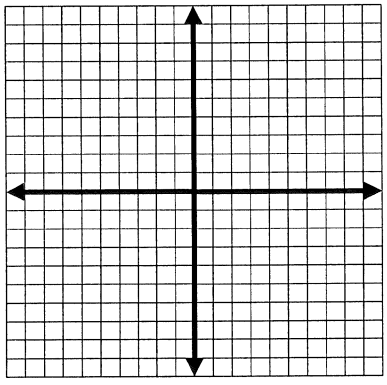
$2x + 5(0) = 20$
$\frac{2x}{2} = \frac{20}{2}$
$x = 10$

$2(0) + 5y = 20$
$\frac{5y}{5} = \frac{20}{5}$
$y = 4$

x-int: (10, 0)

y-int: (0, 4)

12) Find the x- and y-intercepts and graph:
$4x - y = 8$



$4x - 0 = 8$
$\frac{4x}{4} = \frac{8}{4}$
$x = 2$

$4(0) - y = 8$
$\frac{-y}{-1} = \frac{8}{-1}$
$y = -8$

x-int: (2, 0)

y-int: (0, -8)

Write an equation for the following lines.
13) m = 7 and b = -4

$y = 7x - 4$

14) Slope of –1/3 and y-intercept of 1

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

15) Give the slope and y-intercept for the following:

a) $2y = -7(x + 2)$

$\frac{2y}{2} = \frac{-7x - 14}{2}$

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

Slope: $-\frac{7}{2}$ y-int: (0, -7)

b) $y - 9 = 4x + 1$
$+9 \quad +9$

$y = 4x + 10$

Slope: 4 y-int: (0, 10)

16) Write an equation for a line that is perpendicular to $y = -3x + 6$, with a y-intercept of –10.

$m = -3$

$m_{\perp} = +\frac{1}{3}$

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

x	y
4	8
8	7
16	5
20	4

Δx: +4, +8, +4 Δy: -1, -2, -1

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

17) What is the equation for the table above? (8, 7)

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

B $y = -\frac{1}{4}x + 9$ ✓ ✓

C $y = 4x - 6$

D $y = -4x + 20$

$y = mx + b$
$7 = -\frac{1}{4}(8) + b$
$7 = -2 + b$
$+2 \quad +2$
$9 = b$

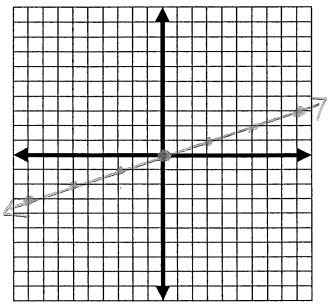
$m = -\frac{1}{4}$

y-int (0, 9)

18) Graph: $2x - 6y = 0$

$-2x \quad -2x$

$\frac{-6y}{-6} = \frac{-2x}{-6}$ $\quad y = \frac{1}{3}x$



y-int (0,0)

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

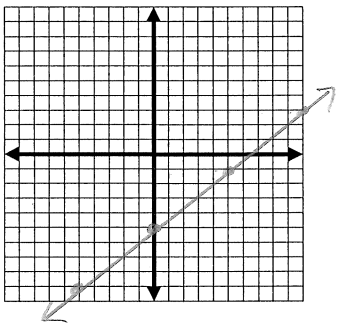
(direct variation: straight line through (0,0).)

19) Graph: $4x - 5y = 25$

$-4x \quad -4x$

$\frac{-5y}{-5} = \frac{-4x}{-5} + \frac{25}{-5}$

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

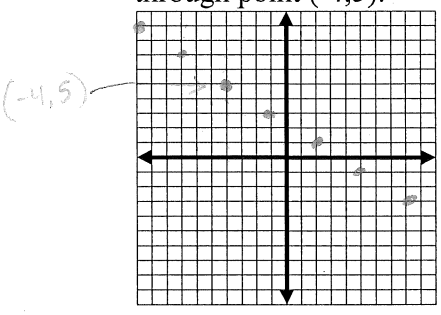


y-int (0,-5)

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

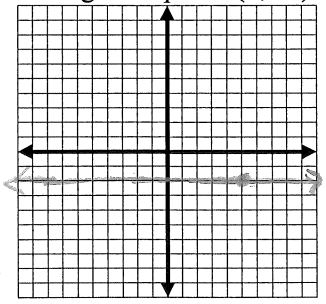
20) Graph a line with slope $-\frac{2}{3}$ $\quad \downarrow 2 \quad \rightarrow 3$

through point (-4,5).



from (-4,5) go down 2 + right 3.

21) Graph a line with slope 0 through the point (5, -2).



Horizontal line
0 slope
y
y
u
x

Find the slope of the line passing through the points:

22) (4, 2) and (9, 7)

$m = \frac{\Delta y}{\Delta x} = \frac{7-2}{9-4} = \frac{5}{5} = 1$

$m = 1$

23) (6, 2) and (-4, -1)

$m = \frac{\Delta y}{\Delta x} = \frac{2-(-1)}{6-(-4)} = \frac{3}{10}$

$m = \frac{3}{10}$

24) $3x + 2y = 15$

$-3x \quad -3x$

$\frac{2y}{2} = \frac{-3x}{2} + \frac{15}{2}$

$y = \frac{-3}{2}x + \frac{15}{2}$

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

y-intercept = $(0, \frac{15}{2})$ $(0, 7\frac{1}{2})$

parallel slope = $-\frac{3}{2}$

perpendicular slope = $+\frac{2}{3}$ (negative & reciprocal)

25) $2y = 3(x - 10)$

$\frac{2y}{2} = \frac{3x}{2} - \frac{30}{2}$

$y = \frac{3}{2}x - 15$

slope = $\frac{3}{2}$

y-intercept = $(0, -15)$

parallel slope = $\frac{3}{2}$

perpendicular slope = $-\frac{2}{3}$ (negative & reciprocal)