Principles of Algebra Name/Date Clee/Today

WS 8A.1 – Writing Equations of Lines

1. Write the equation of a horizontal line that passes through point $(6, 2)$.

All horizontal lines have equation $y =$ constant. The constant is the value of all y-coordinates on the line. $\boxed{y = 2}$

2. Write the equation of a vertical line that passes through point $(6, 2)$.

All vertical lines have equation $x =$ constant. The constant is the value of all x-coordinates on the line. $\boxed{x = 6}$

#3-6 – Write an equation in slope-intercept form for the line that contains the two points.

3. $(3, 4)$ and $(-1, -2)$

① Find slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

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

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

② Find y-intercept:

$y = mx + b$

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

$4 = \frac{9}{2} + b$

$8 = 9 + 2b$

$-\frac{1}{2} = b$

③ Write equation:

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

4. $(7, 2)$ and $(-4, -2)$

① Find slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{(2) - (-2)}{(7) - (-4)} = \frac{4}{11}$

$m = \frac{4}{11}$

② Find y-intercept:

$y = mx + b$

$(2) = (\frac{4}{11})(7) + b$

$2 = \frac{28}{11} + b$

$22 = 28 + 11b$

$-\frac{6}{11} = b$

③ Write equation:

$\boxed{y = \frac{4}{11}x - \frac{6}{11}}$

5. $(7, -7)$ and $(-4, -3)$

① Find slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{(-7) - (-3)}{(7) - (-4)} = \frac{-4}{11}$

$m = -\frac{4}{11}$

② Find y-intercept:

$y = mx + b$

$(-3) = (-\frac{4}{11})(-4) + b$

$-3 = \frac{16}{11} + b$

$-33 = 16 + 11b$

$-\frac{49}{11} = b$

③ Write equation:

$\boxed{y = -\frac{4}{11}x - \frac{49}{11}}$

6. $(6, 6)$ and $(-2, -2)$

① Find slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{(6) - (-2)}{(6) - (-2)} = \frac{8}{8}$

$m = 1$

② Find y-intercept: $y = mx + b$

$(6) = (1)(6) + b$

$6 = 6 + b$

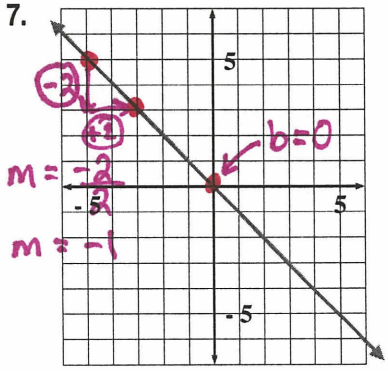
$0 = b$

③ Write equation: $y = 1x + 0$

or $\boxed{y = x}$

#7-9 – Write an equation in slope-intercept form for each graphed line.

7.

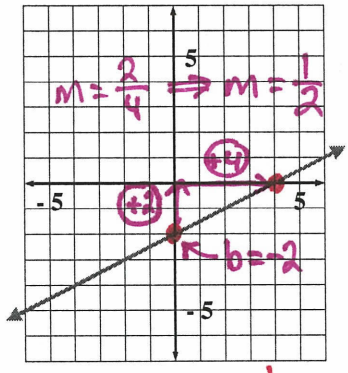


① Find slope: $m = -1$

② Find y-intercept: $b = 0$

③ Write equation: $\boxed{y = -x}$

8.

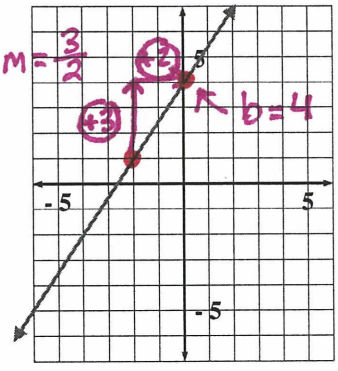


① Find slope: $m = \frac{1}{2}$

② Find y-intercept: $b = -2$

③ Write equation: $\boxed{y = \frac{1}{2}x - 2}$

9.



① Find slope: $m = \frac{3}{2}$

② Find y-intercept: $b = 4$

③ Write equation: $\boxed{y = \frac{3}{2}x + 4}$

#10-11 – Write an equation in slope-intercept form for the line that contains the two points.

10. $(3, 4)$ and $(3, -3)$

① Find slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{(4) - (-3)}{(3) - (3)} = \frac{7}{0}$

m is undefined

If a line has undefined slope, then it is a vertical line. The equation of a vertical line is $x =$ constant. The constant is the value of the x-coordinates on the line.

$(3, 4)$ and $(3, -3)$ $\boxed{x = 3}$

11. $(2, -5)$ and $(10, -5)$

① Find slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{(-5) - (-5)}{(10) - (2)} = \frac{0}{8}$

$m = 0$

If a line has slope 0, then it is a horizontal line. The equation of a horizontal line is $y =$ Constant. The constant is the value of the y-coordinates on the line.

$(2, -5)$ and $(10, -5)$ $\boxed{y = -5}$