

Algebra 1 CP Chapter 4 Practice

1. Write the formulas for the following:

a) slope

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

b) slope-intercept form

$$y = mx + b$$

c) point-slope form

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

d) standard form

$$Ax + By = C$$

2. Find the *slope* of the line through the points $(-6, 7)$ and $\left(\frac{5}{2}, 1\right)$.

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

$$m = \frac{1 - 7}{\frac{5}{2} - (-6)} = \frac{-6}{\frac{17}{2}} = -6 \div \frac{17}{2} = -6 \cdot \frac{2}{17} = \boxed{-\frac{12}{17}}$$

3. Write an equation in *point-slope form* of the line that passes through $(-1, 3)$ and has a slope of 4.

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

$$y - 3 = 4(x - (-1))$$

4. Write an equation in *point-slope form* of the line that passes through the points $(-4, -2)$ and $(1, -17)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-17 - (-2)}{1 - (-4)} = \frac{-15}{5} = -3$$

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

$$y - (-2) = -3(x - (-4))$$

OR

$$y + 17 = -3(x - 1)$$

5. Write an equation in standard form of the line that passes through $(6, -2)$ and has a slope of 5.

$$\begin{aligned}
 & Ax + By = C \\
 & y + 2 = 5(x - 6) \\
 & y + 2 = 5x - 30 \\
 & \begin{array}{r}
 y + 2 = 5x - 30 \\
 -5x \qquad -5x \\
 \hline
 -5x + y + 2 = -30 \\
 \qquad \quad -2 \qquad -2 \\
 \hline
 -5x + y = -32
 \end{array}
 \end{aligned}$$

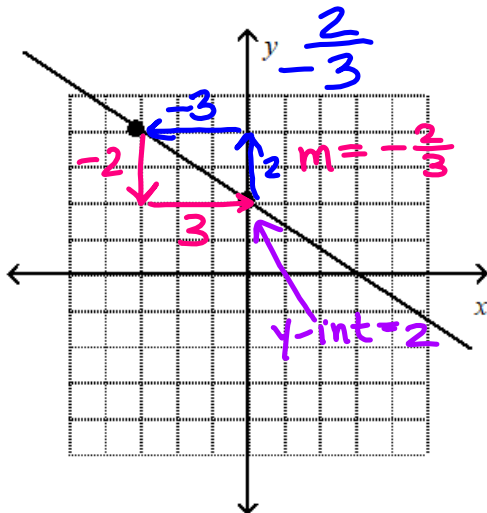
6. Write an equation in standard form of the line that passes through the points $(-3, 1)$ and $(2, -2)$.

$$\begin{aligned}
 & Ax + By = C \\
 & m = \frac{-2 - 1}{2 - (-3)} = \frac{-3}{5} \\
 & 5 \cdot [y - 1] = 5 \left[-\frac{3}{5} (x + 3) \right] \\
 & 5(y - 1) = -3(x + 3) \\
 & \begin{array}{r}
 5y - 5 = -3x - 9 \\
 +3x \qquad +3x \\
 \hline
 3x + 5y - 5 = -9 \\
 \qquad \quad +5 \qquad +5 \\
 \hline
 3x + 5y = -4
 \end{array}
 \end{aligned}$$

7. Write an equation in *slope-intercept form* of a line with a slope of $-\frac{3}{2}$ and a y-intercept of 7.

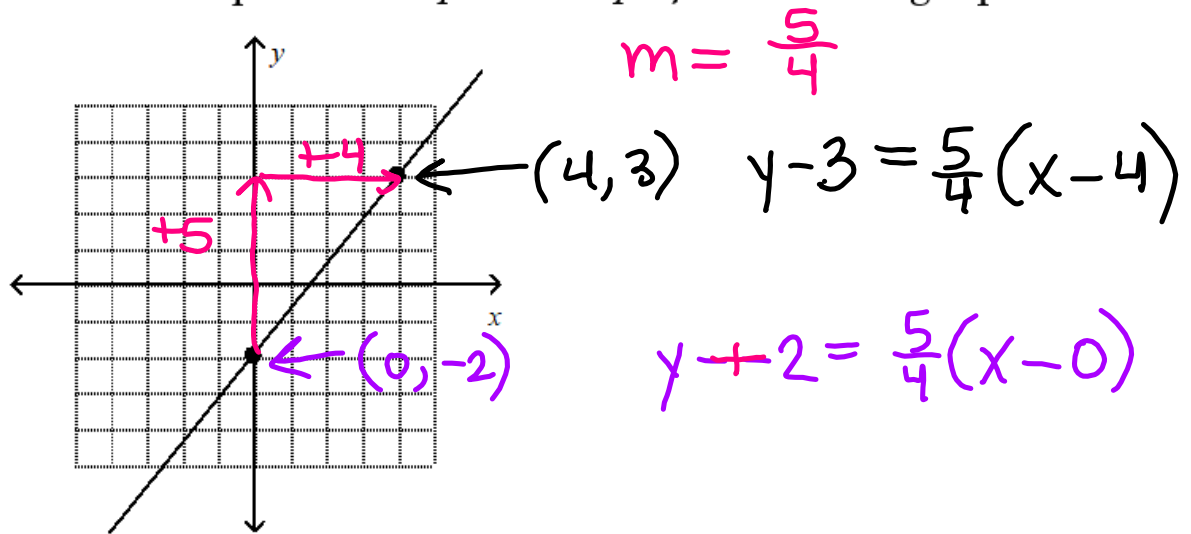
$$y = mx + b$$
$$y = -\frac{3}{2}x + 7$$

8. Write an equation in *slope-intercept form* of the graph.

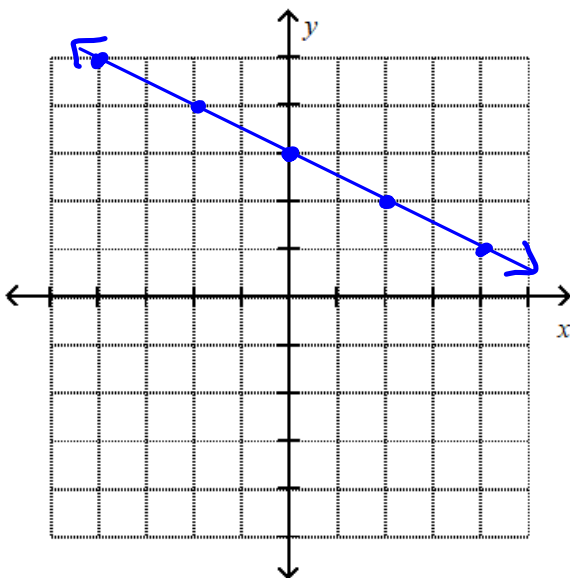


$$y = mx + b$$
$$y = -\frac{2}{3}x + 2$$

9. Write an equation in *point-slope form* of the graph.



10. Sketch the line given by $y = -\frac{1}{2}x + 3$.
- m b



$$y = mx + b$$

11. Write an equation of the line in slope-intercept form that passes through $(2, -4)$ and is parallel to $y = -4x + 7$. $m = -4$ x_1, y_1
same slope

$$\begin{aligned} y + 4 &= -4(x - 2) \\ y + 4 &= -4x + 8 \\ \hline y &= -4x + 4 \end{aligned}$$

$$y = mx + b$$

12. Write an equation of the line in slope-intercept form that passes through $(10, -11)$ and is perpendicular to $y = \frac{2}{5}x - 3$. $m = \frac{2}{5} \rightarrow m_{\perp} = -\frac{5}{2}$ x_1, y_1
opp. rec. slope

$$\begin{aligned} y + 11 &= -\frac{5}{2}(x - 10) \\ y + 11 &= -\frac{5}{2}x + 25 \\ \hline y &= -\frac{5}{2}x + 14 \end{aligned}$$

13. The temperature at 4 p.m. is ^{starting temp.} 44°F and is falling at a rate of 3°F per hour.
_{y-int} slope = -3
- a) Write an equation of the line in slope-intercept form that models this situation.

$$y = mx + b$$

$$y = -3x + 44$$

- b) Determine what the temperature will be by 9 p.m. 5 hours after 4pm

$$y = -3(5) + 44$$

$$y = -15 + 44$$

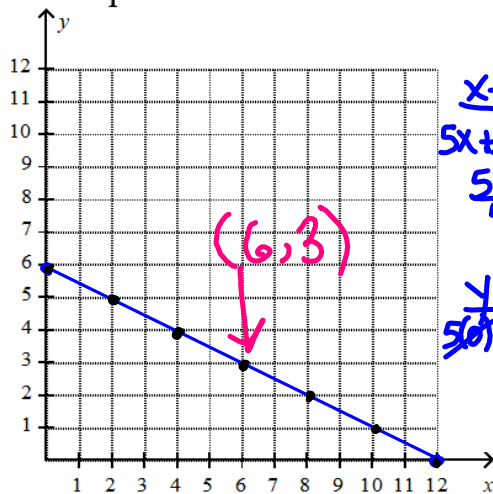
$$y = 29^{\circ}\text{F}$$

14. Jack's wallet contains ^x \$5 bills and ^y \$10 bills. The total value in his wallet is \$60. ^{total}
- a) Write an equation in standard form that models the possible combinations of \$5 bills and \$10 bills in the wallet.

$$Ax + By = C$$

$$5x + 10y = 60$$

- b) Graph the equation.



x-int
 $5x + 10(0) = 60$
 $5x = 60$
 $\frac{5x}{5} = \frac{60}{5}$
 $x = 12$

y-int
 $5(0) + 10y = 60$
 $\frac{10y}{10} = \frac{60}{10}$
 $y = 6$

$$\begin{array}{r} 5x + 10y = 60 \\ -5x \qquad -5x \\ \hline 10y = -5x + 60 \\ \frac{10y}{10} = \frac{-5x + 60}{10} \\ y = -\frac{1}{2}x + 6 \\ m = -\frac{1}{2} \\ y\text{-int} = 6 \end{array}$$

- c) Identify one ordered pair and explain what it means.

$(6, 3) \rightarrow$ six \$5 bills & 3 \$10 bills