

Slope Intercept Line

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

$$m = \frac{5}{3}$$

← Δy
← Δx

up to right

↳ $y_{int} = b$

$$[0, 12]$$

x intercept

$$0 = \frac{5}{3}x + 12$$

$$-12 = \frac{5}{3}x$$

$$\left| \frac{-12}{\left(\frac{5}{3}\right)} = x = \frac{-36}{5} = -7.2 \right|$$

$$\text{OR } 0 = \frac{5}{3}x + 12$$

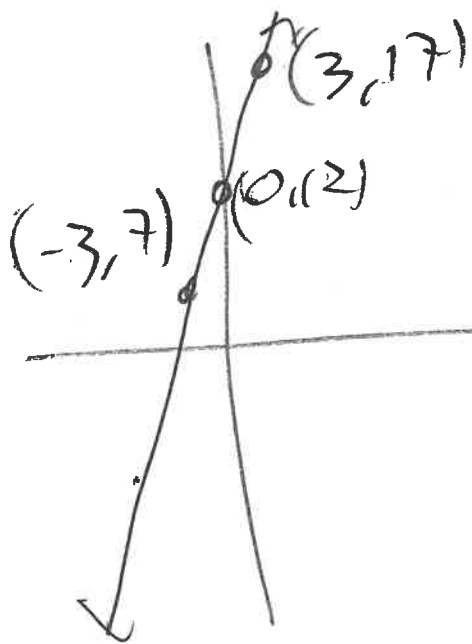
$$3(0 = \frac{5}{3}x + 12)$$

$$0 = 5x + 36$$

$$\begin{array}{r} -36 \\ \hline \end{array}$$

$$-36 = 5x$$

$$\left| x = \frac{-36}{5} = -7.2 \right|$$



Slope Intercept Form Line

$$y = \frac{a}{4}x + 15$$

y-intercept

$$(0, 15)$$

x-intercept

$$0 = \frac{a}{4}x + 15$$

$$-15 = \frac{a}{4}x$$

$$m = \frac{a}{4} \leftarrow \Delta y$$
$$4 \leftarrow \Delta x$$

UP + RIGHT

OR x-intercept

$$0 = \frac{a}{4}x + 15$$

$$4(0 = \frac{a}{4}x + 15)$$

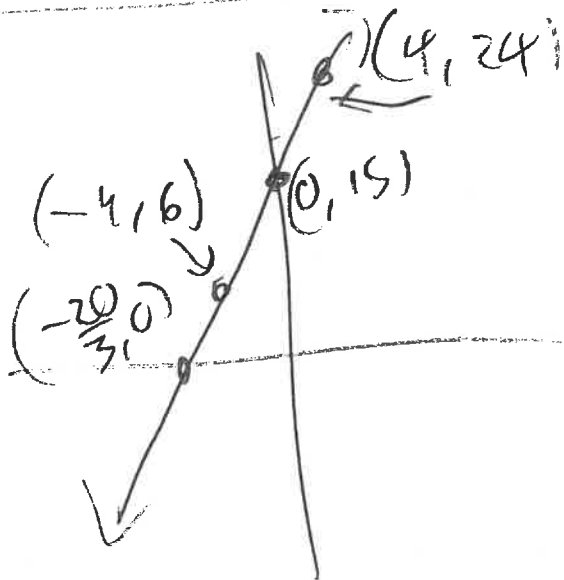
$$0 = ax + 60$$

$$-60 \quad -60$$

$$-60 = ax$$

$$x = \frac{-60}{a}$$
$$= \frac{-20}{3}$$
$$= -6.\bar{6}$$

$$x = \frac{-15}{\left(\frac{a}{4}\right)} = \frac{-15}{1} \cdot \frac{4}{a} = \frac{-60}{a} = \frac{-20}{3} = -6.\bar{6}$$

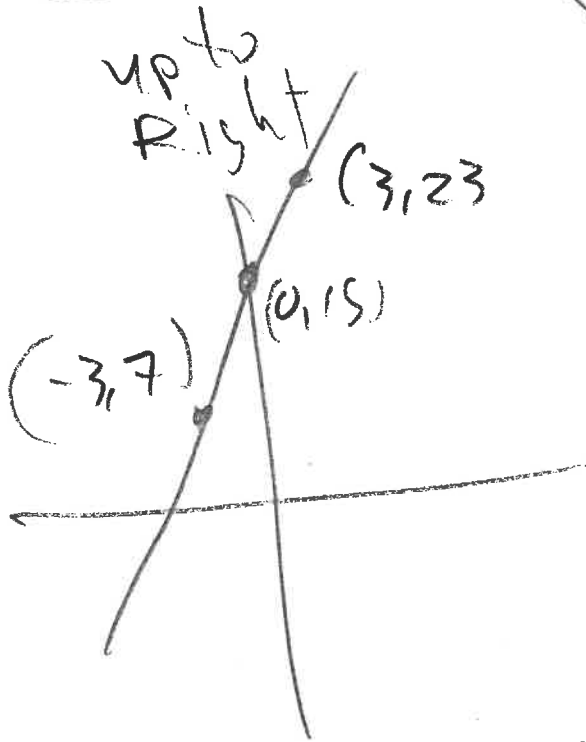


Slope Intercept Form Line

$$y = \frac{8}{3}x + 15$$

$$m = \frac{\Delta y}{\Delta x} \quad b = 15$$

(0, 15)
y-int



x-intercept

$$0 = \frac{8}{3}x + 15$$

$$-15 = \frac{8}{3}x$$

$$\frac{-15}{\left(\frac{8}{3}\right)} = \frac{\frac{8}{3}x}{\frac{8}{3}}$$

$$x = \frac{-15}{\left(\frac{8}{3}\right)} = \frac{-15}{1} \cdot \frac{3}{8} = \frac{-45}{8} = -5.625$$

$$\left(-\frac{45}{8}, 0\right) = (-5.625, 0)$$

OR

$$0 = \frac{8}{3}x + 15$$

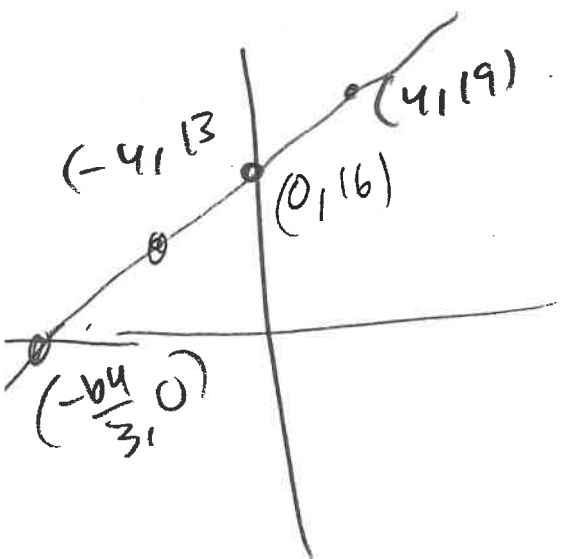
$$3(0 = \frac{8}{3}x + 15)$$

Slope Intercept Form of the Line

$$y = \frac{3}{4}x + 16 \quad b = \text{yint } (0, 16)$$

$$4m = \frac{3}{4} = \frac{\Delta y}{\Delta x}$$

up to right



x-intercept

$$0 = \frac{3}{4}x + 16$$

$$\frac{-16}{-\frac{3}{4}} = \frac{-16 \cdot 4}{-3}$$

$$-16 = \frac{3}{4}x$$

$$x = \frac{-16}{\left(\frac{3}{4}\right)} = -16 \cdot \frac{4}{3} = -\frac{64}{3}$$

$$x = -21.3$$

$$\left(-\frac{64}{3}, 0\right)$$

$$\left(-21.3, 0\right)$$

OR $0 = \frac{3}{4}x + 16$

$$4(0 = \frac{3}{4}x + 16)$$

$$0 = 3x + 64$$

$$\frac{-64}{-3} = \frac{-64}{-3}$$

$$-64 = 3x$$

$$\frac{-64}{3} = \frac{3x}{3}$$

$$x = -\frac{64}{3} = -21.3$$

Standard Form Line

$$-4x + 8y = 48$$

$$A = -4$$

$$B = 8$$

$$C = 48$$

$$\begin{aligned}x_{int} &= \frac{C}{A} \\ &= \frac{48}{-4} \\ &= -12\end{aligned}$$

$$\begin{aligned}y_{int} &= \frac{C}{B} \\ &= \frac{48}{8}\end{aligned}$$

$$\boxed{(-12, 0)}$$

$$\boxed{(0, 6)} = 6$$

$$\text{OR } -4x + 8(0) = 48$$

$$-4x = 48$$

$$x = -\frac{48}{4} = -12$$

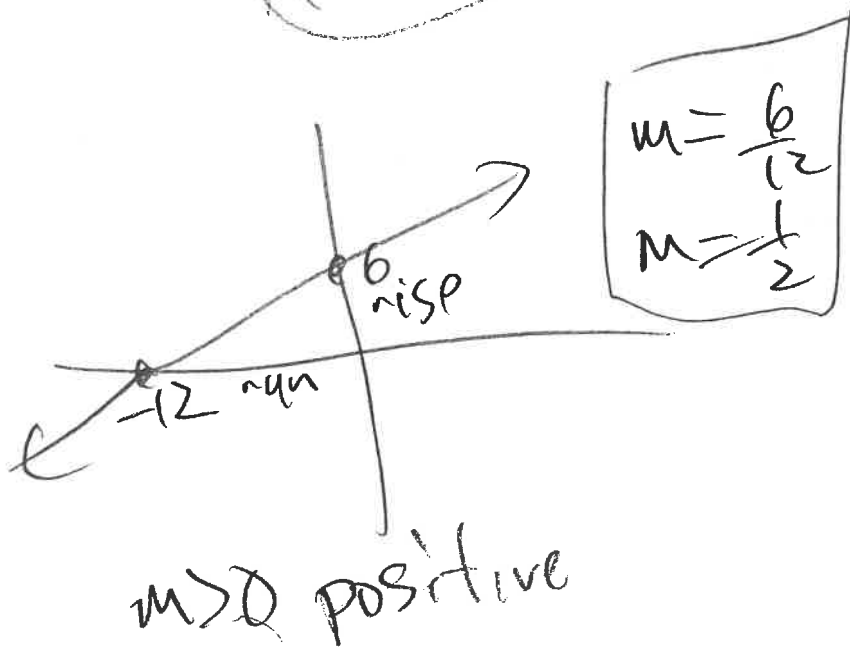
$$\boxed{x = -12}$$

$$-4(0) + 8y = 48$$

$$8y = 48$$

$$y = \frac{48}{8}$$

$$\boxed{y = 6}$$



$$\text{OR } -4x + 8y = 48$$

$$\frac{+4x}{+4x} \quad \frac{+4x}{+4x}$$

$$8y = 4x + 48$$

$$\frac{8y}{8} = \frac{4x + 48}{8}$$

$$y = \frac{4x}{8} + \frac{48}{8}$$

$$\boxed{y = \frac{1}{2}x + 6}$$

Standard Form Line

$$-4x + 5y = 60$$

$$A = -4$$

$$B = 5$$

$$x_{int} = \frac{c}{A}$$

$$= \frac{60}{-4}$$

$$= -15$$

$$\boxed{(-15, 0)}$$

$$y_{int} = \frac{c}{B}$$

$$= \frac{60}{5}$$

$$= 12$$

$$\boxed{(0, 12)}$$

OR

$$-4x + 5(0) = 60$$

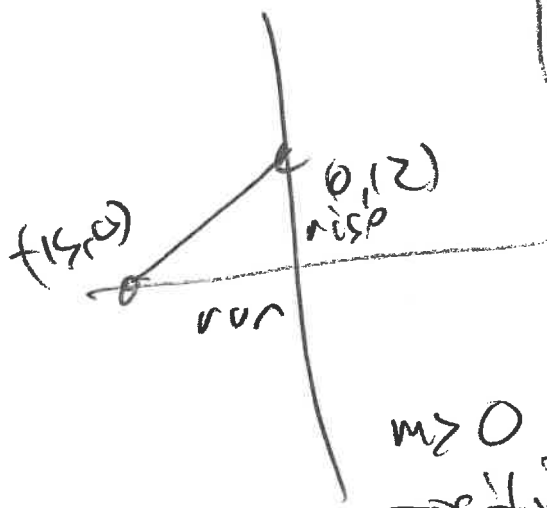
$$-4x = 60$$

$$\boxed{x = \frac{-60}{4} = -15}$$

OR $-4(0) + 5y = 60$

$$5y = 60$$

$$\boxed{y = \frac{60}{5} = 12}$$



$$\boxed{m = \frac{12}{15} = \frac{4}{5}}$$

OR $-4x + 5y = 60$
 $+4x \quad +4x$

$$5y = 4x + 60$$

$$\frac{5y}{5} = \frac{4x + 60}{5}$$

$$y = \frac{4}{5}x + \frac{60}{5}$$

$$\boxed{y = \frac{4}{5}x + 12}$$

Standard Form Line

$$-5x + 10y = 60$$

$$A = -5$$

$$B = 10$$

$$C = 60$$

$$\begin{aligned}x\text{int} &= \frac{C}{A} \\ &= \frac{60}{-5} \\ &= -12\end{aligned}$$

$$y\text{int} = \frac{C}{B}$$

$$= \frac{60}{10}$$

$$= 6$$

$$(-12, 0)$$

$$(0, 6)$$

$$\text{OR } -5x + 10(0) = 60$$

$$-5x = 60$$

$$\boxed{x = \frac{60}{-5} = -12}$$

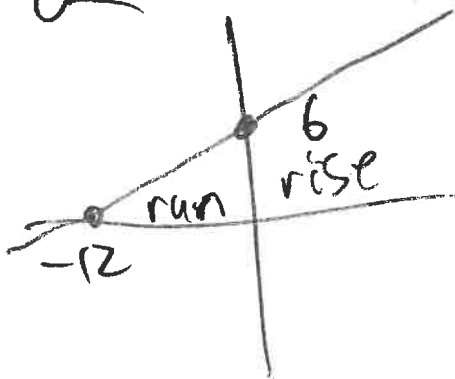
$$\text{OR } 5(0) + 10y = 60$$

$$10y = 60$$

$$\boxed{y = \frac{60}{10} = 6}$$

$$m = -\frac{A}{B} = \frac{5}{10} = \frac{1}{2}$$

OR



$$m = \frac{6}{12} = \frac{1}{2}$$

$$\boxed{y = \frac{1}{2}x + 6}$$

$$\text{OR } \begin{array}{r} -5x + 10y = 60 \\ +5x \qquad +5x \\ \hline 10y = 5x + 60 \end{array}$$

$$10y = 5x + 60$$

$$\frac{10y}{10} = \frac{5x + 60}{10}$$

$$y = \frac{5}{10}x + \frac{60}{10}$$

$$\boxed{y = \frac{1}{2}x + 6}$$

$m > 0$ POSITIVE

Standard Form Line

$$-3x + by = 24$$

$$A = -3$$

$$B = 6$$

$$C = 24$$

$$x_{int} = \frac{c}{A}$$
$$= \frac{24}{-3} = -8$$

$$(-8, 0)$$

$$y_{int} = \frac{C}{B}$$
$$= \frac{24}{6} = 4$$
$$(0, 4)$$

OR $-3x + 6(0) = 24$

$$-3x = 24$$

$$\boxed{x = -8}$$

$3(0) + by = 24$

$$6y = 24$$

$$\boxed{y = 4}$$

$$m = -\frac{A}{B} = \frac{3}{6} = \frac{1}{2}$$

OR $-3x + by = 24$
 $+3x \qquad \qquad +3x$

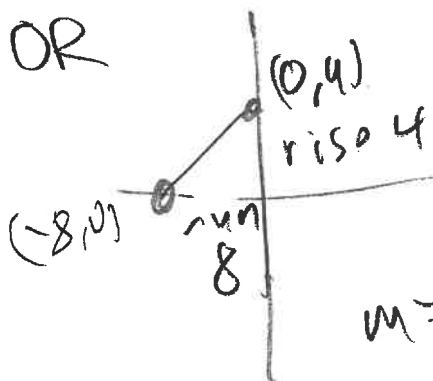
$$6y = 3x + 24$$

$$\frac{6y}{6} = \frac{3x + 24}{6}$$

$$y = \frac{3}{6}x + \frac{24}{6}$$

$$\boxed{y = \frac{1}{2}x + 4}$$

OR



$$m = \frac{4}{8} = \frac{1}{2}$$

$m > 0$ positive

Point Slope Form Line

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

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

(x_1, y_1)
implied
Point

$$y = -\frac{5}{6}(x + 12) - 3$$

$$y + 3 = -\frac{5}{6}(x - -12)$$

$$y - -3 = -\frac{5}{6}(x - -12)$$

implied point $(-12, -3)$

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

Down
to
Right

y-intercept

$$y = -\frac{5}{6}(0 + 12) - 3$$

$$= -\frac{60}{6} - 3$$

$$= -10 - 3$$

$$y = -13$$

$(0, -13)$

OR

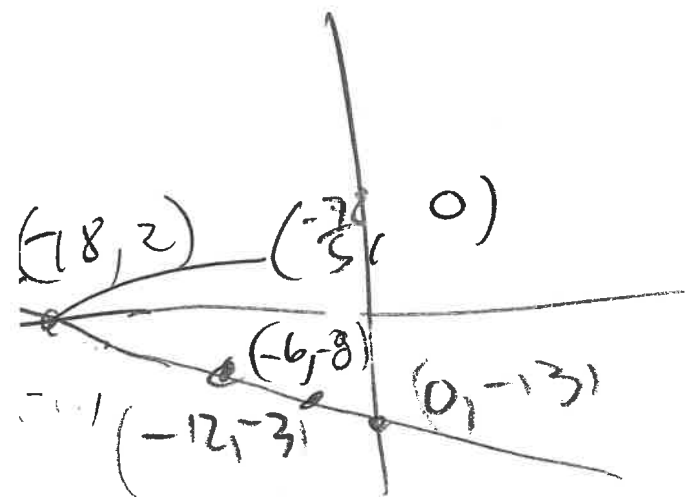
$$y = -\frac{5}{6}(x + 12) - 3$$

$$= -\frac{5}{6}x - \frac{60}{6} - 3$$

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

$$y = -\frac{5}{6}x - 13$$

slope
intercept
form



X-intercept

OR

$$0 = -\frac{5}{6}x - 13$$

$$0 = -\frac{5}{6}x - 13$$

$$(13 = -\frac{5}{6}x) \cdot 6$$

$$13 = -\frac{5}{6}x$$

$$78 = -5x$$

$$\frac{13}{(-\frac{5}{6})} = x$$

$$x = -\frac{78}{5}$$

$$\left(-\frac{78}{5}\right) = x$$

$$x = -15.6$$

$$x = -\frac{78}{5}$$

$$\left(-\frac{78}{5}, 0\right) = (-15.6, 0)$$

Point Slope Form Line

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

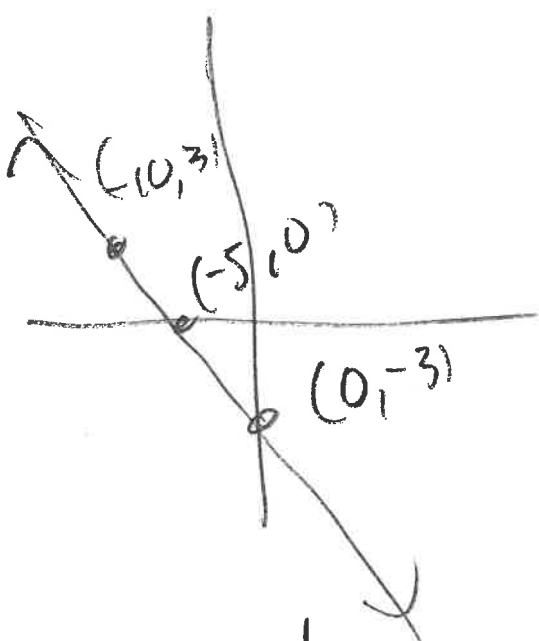
(x_1, y_1) on line

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

$$y = -\frac{3}{5}(x - (-10)) + 3$$

$\frac{-3}{5} = m$ Down to Right

implied point $(-10, 3)$



$$\begin{aligned} \text{yint } y &= -\frac{3}{5}(0 + 10) + 3 \\ &= -\frac{3 \cdot 10}{5} + 3 \\ &= -6 + 3 \\ &= -3 \end{aligned}$$

$(0, -3)$

$$\text{OR } y = -\frac{3}{5}x - \frac{30}{5} + 3$$

$$y = -\frac{3}{5}x - 6 + 3$$

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

slope
intercept
form

x-intercept

$$0 = -\frac{3}{5}x - 3$$

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

$$15 = -3x$$

$$x = -5$$

$(-5, 0)$

OR

$$0 = -\frac{3}{5}x - 3$$

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

$$x = \frac{3}{-\frac{3}{5}} = \frac{-15}{3} = -5$$

Point Slope Form Line (Modified)

$$y - y_1 = m(x - x_1) \leftarrow (x_1, y_1) \text{ implied point}$$

$$y = m(x - x_1) + y_1 \leftarrow$$

$$y = \frac{-6}{5}(x + 30) - 7$$

$$y = \frac{-6}{5}(x - -30) - 7$$

$$y - 7 = \frac{-6}{5}(x - -30)$$

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

implied point $(-30, -7)$

Down to right

y intercept

$$y = \frac{-6}{5}x - \frac{180}{5} - 7$$

$$y = \frac{-6}{5}x - 36 - 7$$

$$y = \frac{-6}{5}x - 43$$

$$(0, -43)$$

OR

$$y = \frac{-6}{5}(0 + 30) - 7$$

$$= \frac{-180}{5} - 7$$

$$y = -36 - 7 = -43$$

$$0 = \frac{-6}{5}x - 43$$

$$5\left(\frac{-6}{5}x - 43\right) = 0$$

$$-6x - 215 = 0$$

$$-6x = 215$$

$$x = \frac{-215}{6}$$

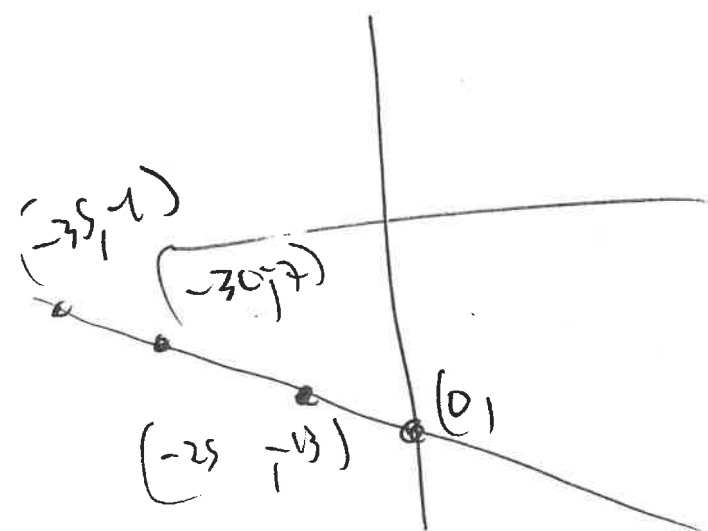
x intercept

$$\left(\frac{-215}{6}, 0\right)$$

$$\text{OR } 0 = \frac{-6}{5}x - 43$$

$$43 = \frac{-6}{5}x$$

$$x = \frac{43}{\left(\frac{-6}{5}\right)} = \frac{-215}{6}$$



Point Slope (Modified) Form Line

$$y - y_1 = m(x - x_1) \leftarrow (x_1, y_1) \text{ implied}$$

$$y = m(x - x_1) + y_1 \text{ modified}$$

$$y = \left(\frac{-7}{2}\right)(x + 4) - 5$$

$(-4, -5)$ on line

$$m = \frac{-7}{2}$$

Down to Right

implies
 $(x = -4)$
 $x_1 = -4$

implies
 $y_1 = -5$

$$\begin{aligned} y &= \frac{-7}{2}(x + 4) - 5 \\ &= \frac{-7}{2}x - \frac{28}{2} - 5 \\ &= \frac{-7}{2}x - 14 - 5 \end{aligned}$$

$$y = \frac{-7}{2}x - 19$$

slope intercept $(0, -19)$
 y -int

OR $y = \frac{-7}{2}(0 + 4) - 5$
 $= -14 - 5 = -19$

$$\begin{aligned} 0 &= \frac{-7}{2}x - 19 \rightarrow 19 = \frac{-7}{2}x \\ &\rightarrow x = \frac{19}{\left(\frac{-7}{2}\right)} = \frac{-38}{7} \end{aligned}$$

$$\left(\frac{-38}{7}, 0\right) \text{ x-intercept}$$

