

Name Key


Write solutions in the space provided (no credit for work on separate paper). Reduce fractions if possible. Scientific calculator is allowed. No notes, books, phones, or other electronics allowed. Each problem is 5 points.

1. Solve and write in interval notation: $3(4 - x) < 24$

$$\begin{array}{r} 12 - 3x < 24 \\ -12 \qquad \qquad -12 \end{array}$$

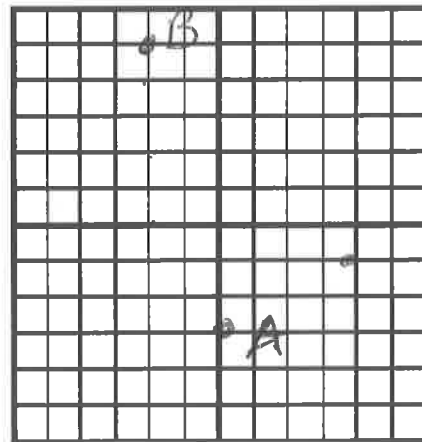
$$\begin{array}{r} -3x < \frac{12}{-3} \\ \frac{-3x}{-3} < \frac{12}{-3} \end{array} \quad \text{switch}$$

$$x > -4$$

Graph (not required):

 Interval Notation:
 $(-4, \infty)$

2. For each point below, graph and state the quadrant or axis.

Point	Quadrant or axis
A(0, -3)	y-axis
B(-2, 5)	Q II
C(4, -1)	Q IV



3. For the equation $y = 3x + 7$, complete the ordered pairs:

$$(0, 7) \quad x=0 \Rightarrow y = 3(\cancel{0}) + 7, y = 7$$

$$\left(-\frac{7}{3}, 0\right) \quad y=0 \Rightarrow 0 = 3\left(\frac{-7}{3}\right) + 7 \quad \frac{-7}{3} = \frac{3x}{3}$$

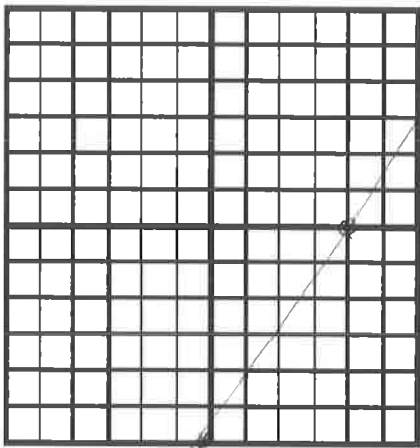
$$\begin{aligned} (-1, 4) \quad y=4 \Rightarrow 4 &= 3x + 7 \\ -7 &\quad -7 \\ \frac{-3}{3} &= \frac{3x}{3} \quad ; \quad x = -1 \end{aligned}$$

4. Find the intercepts of the equation $3x - 2y = 12$

x-intercept $(4, 0)$ $y=0 \Rightarrow 3x=12, x=4$

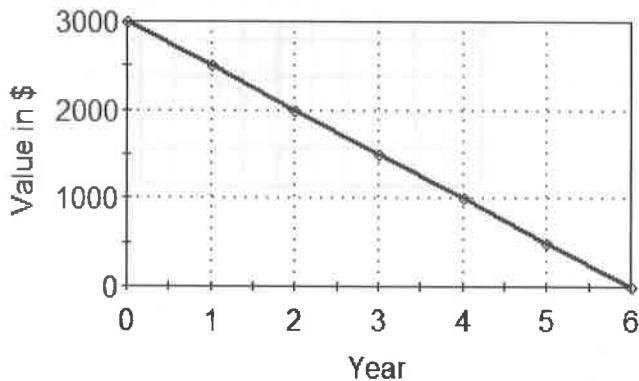
y-intercept $(0, -6)$ $x=0 \Rightarrow \frac{-2y}{-2} = \frac{12}{-2} \quad y = -6$

5. Graph the equation $3x - 2y = 12$ (same equation as above)



6. For the graph:

Photocopier Depreciation



- a) Write the ordered pairs of 2 points on the graph.

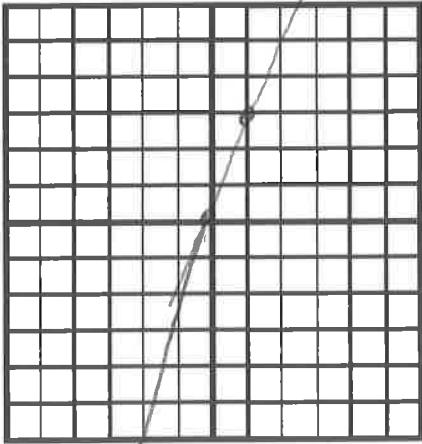
$(0, 3000)$
 $(6, 0)$

- b) Calculate the rate of depreciation.

$$\text{rate} = \text{slope} = \frac{3000 - 0}{0 - 6} = \frac{3000}{-6} = -500$$

(lose \$500 in value each year)

7. Graph the equation: $y = 3x$



$$\begin{array}{r|l} x & y \\ \hline (0 & 0) \\ 1 & 3 \end{array}$$

$$y = 3(0)$$

$$y = 3(1) = 3$$

8. For the line $y = 3x$, give the slope and y-intercept

Slope: slope = $m = 3$

y-intercept: $(0, 0)$

9. Find the slope of the line passing through the points $(3, -5)$ and $(-1, -2)$.

$$m = \frac{-2 - (-5)}{-1 - 3} = \frac{3}{-4} = -\frac{3}{4}$$

10. Find the equation of the line through the point $(5, -1)$ with slope $= -\frac{3}{5}$

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

$$y + 1 = -\frac{3}{5}(x - 5)$$

$$y = -\frac{3}{5}x + \frac{3}{5} - 1$$

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

11. Find the equation of the line through the points $(4, 3)$ and $(0, 3)$.

$$m = \frac{3 - 3}{0 - 4} = \frac{0}{-4} = 0$$

$$y - 3 = 0(x - 4) \quad ; \quad y = 3$$

$\begin{array}{cc} +3 & +3 \end{array}$

12. For the lines $y = 2x - 11$ and $x + 2y = 4$:

a) Give the slopes of both lines.

$$y = 2x - 11 \quad ; \quad m_1 = 2$$

$$\begin{array}{r} x + 2y = 4 \\ -x \qquad -x \end{array}$$

$$m_2 = -\frac{1}{2}$$

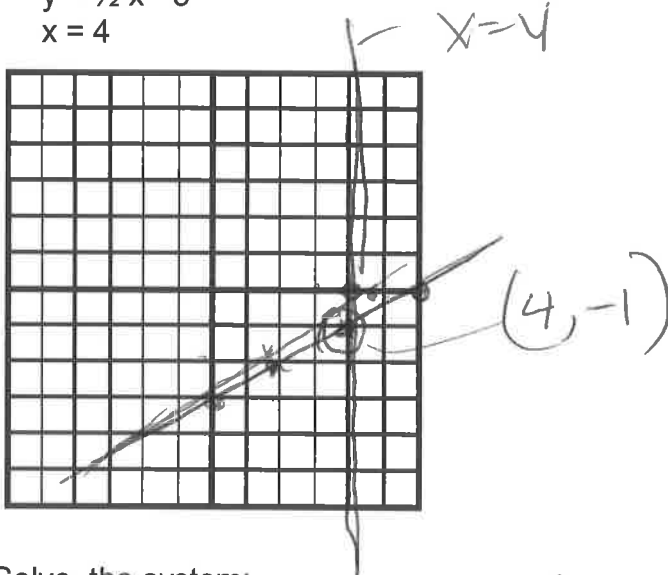
$$\frac{2y}{2} = \frac{-x + 4}{2} \quad ; \quad y = \left(-\frac{1}{2}\right)x + 2$$

b) Are the lines parallel, perpendicular or neither?

13. Graph each of the 2 lines below, then give the ordered pair solution found by graphing

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

$$x = 4$$



14. Solve the system:

$$2x - y = 4$$

$$3x + y = 21$$

same amount, opposite sign

$$5x = 25$$

$$x = 5$$

$$(5, b)$$

$$2x - y = 4$$

$$\begin{array}{r} \uparrow \\ 5 \\ 10 - y = 4 \end{array}$$

$$6 = y$$

15. Solve the system:

$$15x - 3y = -6$$

$$y = 5x + 4$$

$$15x - 3(5x + 4) = -6$$

$$15x - 15x - 12 = -6$$

$$-12 = -6$$

no solution

16. At a zoo, a family of 2 children and 3 adults pays \$27 for tickets. A group of 4 children and 5 adults pays \$47. What is the price of each adult ticket and each children's ticket?

$$-2 \quad (2C + 3A = 27)$$

$$4C + 5A = 47$$

$$-4C - 6A = -54$$

$$\underline{4C + 5A = 47}$$

$$-A = -7; \quad \boxed{A = 7}$$

$$2C + 3(7) = 27, \quad 2C + 21 = 27$$

$$2C = 6, \quad \boxed{C = 3}$$

C = Price of child's ticket

A = " " adult's ticket

\$7 for ~~adult~~ adult ticket

\$3 for a child's ticket

17. Amy's test scores so far are 84 and 87. What must she earn on the 3rd test if she wants at least a "B" average (where the lowest B is 80)?

$$\text{Avg} = \frac{84 + 87 + x}{3} \geq 80$$

$$\left(\frac{171 + x}{3} \right)^3 \geq 80(3)$$

$$\frac{171 + x}{-171} \geq \frac{240}{+171}, \quad \boxed{x \geq 69}$$

A score of 69
or above earns
a "B" average

Bonus (2 pts): Is it possible for her to earn an "A" average (90)? If so, what score is needed?

$$\text{Avg} = \frac{171 + x}{3} \geq 90, \quad \frac{171 + x}{-171} \geq \frac{270}{-171}$$

$$\boxed{x \geq 99}$$

yes - possible, but
hard; need 99 or 100.

