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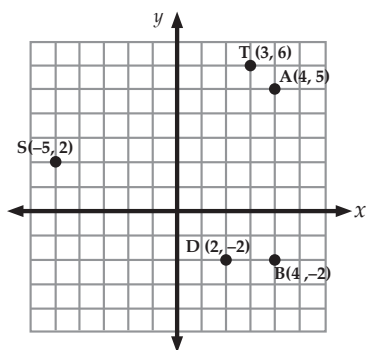
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EXERCISE SOLUTIONS

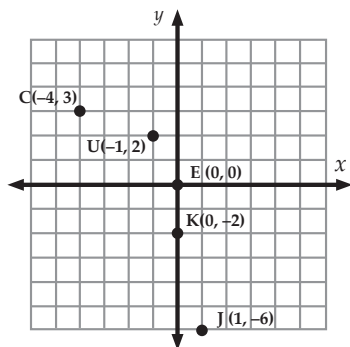
UNIT I

LESSON 1

1. (3, 5)
2. 0
3. IV or 4
4. (6, -3)
5. 6
6. 0
7. 3
8. 3
9. -3
10. Q
11. (-4, 0)
12. 3
13. 5
14. I or 1
15. -4
- 16-20.



21-25.



LESSON 2

1. $4(0) - 3(0) = 12$
 $0 - 0 = 12$
 $0 = 12$
 False
 Not a solution
2. $4(3) - 3(0) = 12$
 $12 - 0 = 12$
 $12 = 12$
 True
 Is a solution
3. $4(0) - 3(4) = 12$
 $0 - 12 = 12$
 $-12 = 12$
 False
 Not a solution
4. $4(6) - 3(4) = 12$
 $24 - 12 = 12$
 $12 = 12$
 True
 Is a solution
5. $4(0) - 3(-4) = 12$
 $0 + 12 = 12$
 $12 = 12$
 True
 Is a solution
6. $4(-3) - 3(-8) = 12$
 $-12 + 24 = 12$
 $12 = 12$
 True
 Is a solution
7. $3(0) + y = 3$
 $0 + y = 3$
 $y = 3$
 $(0, 3)$
8. $3x + 6 = 3$
 $3x + 6 + (-6) = 3 + (-6)$
 $3x + 0 = -3$
 $3x = -3$
 $\div \frac{1}{3} \quad \div \frac{1}{3}$
 $\frac{1}{3} \cdot 3x = \frac{1}{3} \cdot -3$
 $1x = -1$
 $x = -1$
 $(-1, 6)$

$$\begin{aligned}
 9. \quad & 3(6) + y = 3 \\
 & 9 + y = 3 \\
 & 9 + y + -9 = 3 + -9 \\
 & 0 + y = -6 \\
 & y = -6 \\
 & (3, -6)
 \end{aligned}$$

$$\begin{aligned}
 10. \quad & 3(4) + y = 3 \\
 & 12 + y = 3 \\
 & 12 + y + -12 = 3 + -12 \\
 & 0 + y = -9 \\
 & y = -9 \\
 & (4, -9)
 \end{aligned}$$

$$\begin{aligned}
 11. \quad & 3x + 0 = 3 \\
 & 3x = 3 \\
 & \frac{1}{3} \cdot 3x = \frac{1}{3} \cdot 3 \\
 & \frac{3}{3}x = \frac{3}{3} \\
 & 1x = 1 \\
 & x = 1 \\
 & (1, 0)
 \end{aligned}$$

$$\begin{aligned}
 12. \quad & 3x + (-3) = 3 \\
 & 3x + (-3) + 3 = 3 + 3 \\
 & 3x + 0 = 6 \\
 & 3x = 6 \\
 & \frac{1}{3} \cdot 3x = \frac{1}{3} \cdot 6 \\
 & \frac{3}{3}x = \frac{6}{3} \\
 & 1x = 2 \\
 & x = 2 \\
 & (2, -3)
 \end{aligned}$$

$$\begin{aligned}
 13. \quad & 2(9) - 3y = 6 \\
 & 18 - 3y = 6 \\
 & 18 - 3y + (-18) = 6 + (-18) \\
 & 0 - 3y = -12 \\
 & -3y = -12 \\
 & \frac{1}{-3} \cdot -3y = \frac{1}{-3} \cdot -12 \\
 & \frac{-3}{-3}y = \frac{-12}{-3} \\
 & 1y = 4 \\
 & y = 4 \\
 & (9, 4)
 \end{aligned}$$

$$\begin{aligned}
 14. \quad & 2x - 3(2) = 6 \\
 & 2x - 6 = 6 \\
 & 2x - 6 + 6 = 6 + 6 \\
 & 2x + 0 = 12 \\
 & 2x = 12 \\
 & \frac{1}{2} \cdot 2x = \frac{1}{2} \cdot 12 \\
 & \frac{2}{2}x = \frac{12}{2} \\
 & 1x = 6 \\
 & x = 6 \\
 & (6, 2)
 \end{aligned}$$

$$\begin{aligned}
 15. \quad & 2(0) - 3y = 6 \\
 & 0 - 3y = 6 \\
 & -3y = 6 \\
 & \frac{1}{-3} \cdot -3y = \frac{1}{-3} \cdot 6 \\
 & \frac{-3}{-3}y = \frac{6}{-3} \\
 & 1y = -2 \\
 & y = -2 \\
 & (0, -2)
 \end{aligned}$$

$$\begin{aligned}
 16. \quad & 2(-6) - 3y = 6 \\
 & -12 - 3y = 6 \\
 & -12 - 3y + 12 = 6 + 12 \\
 & 0 - 3y = 18 \\
 & -3y = 18 \\
 & \frac{1}{-3} \cdot -3y = \frac{1}{-3} \cdot 18 \\
 & \frac{-3}{-3}y = \frac{18}{-3} \\
 & 1y = -6 \\
 & y = -6 \\
 & (-6, -6)
 \end{aligned}$$

$$\begin{aligned}
 17. \quad & 2(-3) - 3y = 6 \\
 & -6 - 3y = 6 \\
 & -6 - 3y + 6 = 6 + 6 \\
 & 0 - 3y = 12 \\
 & -3y = 12 \\
 & \frac{1}{-3} \cdot -3y = \frac{1}{-3} \cdot 12 \\
 & \frac{-3}{-3}y = \frac{12}{-3} \\
 & 1y = -4 \\
 & y = -4 \\
 & (-3, -4)
 \end{aligned}$$

LESSON 12

1. Two solutions are: (2, 3) and (5, 6)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - 3}{5 - 2} = \frac{3}{3} = 1$$

$$y = mx + b$$

$$y = 1x + b$$

Use (2, 3) arbitrarily.

$$3 = 1(2) + b$$

$$3 = 2 + b$$

$$3 + (-2) = 2 + b + (-2)$$

$$1 = 0 + b$$

$$1 = b$$

$$\text{So } y = 1x + 1$$

$$y = x + 1$$

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

$$-1x + 1y = 1$$

2. Two solutions are: (0, 0) and (-1, 2)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 0}{-1 - 0} = \frac{2}{-1} = -2$$

$$y = mx + b$$

$$y = -2x + b$$

Use (-1, 2) arbitrarily.

$$2 = -2(-1) + b$$

$$2 = 2 + b$$

$$2 + (-2) = 2 + b + (-2)$$

$$0 = 0 + b$$

$$0 = b$$

$$\text{So } y = -2x + 0$$

$$y = -2x$$

$$y + 2x = -2x + 2x$$

$$2x + 1y = 0$$

3. Two points on the line are: (-4, -4) and (-2, 1)

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

$$y = mx + b$$

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

Use (-4, -4) arbitrarily.

$$-4 = \frac{5}{2}(-4) + b$$

$$-4 = \frac{-20}{2} + b$$

$$-4 = -10 + b$$

$$10 + (-4) = -10 + b + 10$$

$$6 = 0 + b$$

$$6 = b$$

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

$$\frac{2}{1}y = \frac{2}{1}(\frac{5}{2}x + 6)$$

$$2y = \frac{10}{2}x + 12$$

$$2y = 5x + 12$$

$$2y + (-5x) = 5x + 12 + (-5x)$$

$$-5x + 2y = 12$$

4. Two points on the line are: (-5, 1) and (0, 2)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 1}{0 - (-5)} = \frac{1}{0 + 5} = \frac{1}{5}$$

$$y = mx + b$$

$$y = \frac{1}{5}x + b$$

Use (-5, 1) because $x = -5$

$$1 = \frac{1}{5}(-5) + b$$

$$1 = \frac{-5}{5} + b$$

$$1 = -1 + b$$

$$1 + 1 = -1 + b + 1$$

$$2 = 0 + b$$

$$2 = b$$

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

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

$$5y = \frac{5}{5}x + \frac{10}{1}$$

$$5y = 1x + 10$$

$$5y = x + 10$$

$$5y + (-x) = x + 10 + (-x)$$

$$-1x + 5y = 10$$

5. Two points on the line are: (0, -1) and (4, -3)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3 - (-1)}{4 - 0} = \frac{-3 + 1}{4} = \frac{-2}{4} = \frac{-1}{2}$$

$$y = mx + b$$

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

Use (0, -1) arbitrarily.

$$-1 = \frac{-1}{2}(0) + b$$

$$-1 = 0 + b$$

$$-1 = b$$

$$\text{So } y = \frac{-1}{2}x + (-1)$$

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

$$\frac{2}{-1} \cdot y = \frac{2}{-1} \cdot \left(\frac{-1}{2}x - 1 \right)$$

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

$$-2y = 1x + 2$$

$$-2y = x + 2$$

$$-2y + 1x = x + 2 + 1x$$

$$-1x - 2y = 2$$

6. Two points on the line are: (2, 4) and (3, 7)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 4}{3 - 2} = \frac{3}{1} = 3$$

$$y = mx + b$$

$$y = 3x + b$$

Use (3, 7) arbitrarily.

$$7 = 3(3) + b$$

$$7 = 9 + b$$

$$-9 + 7 = 9 + b + (-9)$$

$$-2 = 0 + b$$

$$-2 = b$$

$$\text{So } y = 3x + (-2)$$

$$y = 3x - 2$$

$$1y + 1-3x = 3x - 2 + 1-3x$$

$$-3x + 1y = -2$$

7. Two solutions are: (5, -3) and (0, 0)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - (-3)}{0 - 5} = \frac{0 + 3}{-5} = \frac{3}{-5}$$

$$y = mx + b$$

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

Use (0, 0) arbitrarily.

$$0 = \frac{3}{-5}(0) + b$$

$$0 = 0 + b$$

$$0 = b$$

$$\text{So } y = \frac{3}{-5}x + 0$$

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

$$\frac{-5}{1} \cdot y = \frac{-5}{1} \cdot \left(\frac{3}{-5}x \right)$$

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

$$-5y = 3x$$

$$-5y + 1-3x = 3x + 1-3x$$

$$-3x - 5y = 0$$

8. Two points on the line are: (0, 5) and (3, 5)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 5}{3 - 0} = \frac{0}{3} = 0$$

$$y = mx + b$$

$$y = 0x + b$$

Use (0, 5) arbitrarily.

$$5 = 0(0) + b$$

$$5 = 0 + b$$

$$5 = b$$

$$\text{So } y = 0x + 5$$

$$y = 5$$

$$0x + 1y = 5$$

9. Two solutions are: (1, 3) and (1, 7)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 3}{1 - 1} = \frac{4}{0}, \text{ which means "no slope"}$$

So, our equation is $x = 1$ where the line will be vertical. No restrictions are placed on y .

10. Two points on the line are: (1, 4) and (3, 6)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - 4}{3 - 1} = \frac{2}{2} = 1$$

$$y = mx + b$$

$$y = 1x + b$$

Use (3, 6) arbitrarily.

$$6 = 1(3) + b$$

$$6 = 3 + b$$

$$-3 + 6 = 3 + b + (-3)$$

$$3 = 0 + b$$

$$3 = b$$

$$\text{So } y = 1x + 3$$

$$y = x + 3$$

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

$$-x + y = 3$$

LESSON 13

1.

$$x + 2y = 6$$

$$x + 2y + (-x) = 6 + (-x)$$

$$0 + 2y = -x + 6$$

$$2y = -x + 6$$

$$\frac{1}{2}(2y) = \frac{1}{2}(-x + 6)$$

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

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

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

$$\text{So } y = \frac{-1}{2}x + b$$

with (3, 7) =

$$7 = \frac{-1}{2}(3) + b$$

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

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

$$\frac{3}{2} + \frac{14}{2} = 0 + b$$

$$\frac{17}{2} = b$$

$$y = \frac{-1}{2}x + \frac{17}{2}$$

2.

$$2x - y = 7$$

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

$$0 - y = -2x + 7$$

$$-y = -2x + 7$$

$$(-1)(-y) = (-1)(-2x + 7)$$

$$y = 2x - 7$$

$$m = 2$$

$$\text{So } y = 2x + b$$

with (0, 3) =

$$3 = 2(0) + b$$

$$3 = 0 + b$$

$$3 = b$$

$$y = 2x + 3$$

3.

$$5x - 7y = 8$$

$$5x - 7y + (-5x) = 8 + (-5x)$$

$$0 - 7y = 8 + (-5x)$$

$$-7y = -5x + 8$$

$$\frac{1}{-7}(-7y) = \frac{1}{-7}(-5x + 8)$$

$$\frac{-7}{-7}y = \frac{-5}{-7}x + \frac{8}{-7}$$

$$1y = \frac{5}{7}x + \frac{-8}{7}$$

$$y = \frac{5}{7}x + \frac{-8}{7}$$

$$m = \frac{5}{7}$$

with (2, -1) =

$$-1 = \frac{5}{7}(2) + b$$

$$-1 = \frac{10}{7} + b$$

$$\frac{-10}{7} + (-1) = \frac{10}{7} + b + \frac{-10}{7}$$

$$\frac{-10}{7} + \frac{-7}{7} = 0 + b$$

$$\frac{-17}{7} = b$$

$$\text{So } y = \frac{5}{7}x + \frac{-17}{7}$$

$$y = \frac{5}{7}x - \frac{17}{7}$$