

Unit 6 Study Guide

1. The seventh and eighth grade band held a joint concert. They sold 5 more children's tickets than adult tickets. The adult tickets cost twice the amount of children's tickets. If they sold adult tickets for \$4 and children's tickets for \$2 and made \$310, how many of each type did they sell?

$$\begin{aligned}
 c &= a + 5 \\
 4a + 2c &= 310 \\
 4a + 2(a + 5) &= 310 \\
 4a + 2a + 10 &= 310 \\
 6a + 10 &= 310 \\
 6a &= 300 \\
 a &= 50 \\
 c &= 50 + 5 \\
 c &= 55
 \end{aligned}$$

2. Wendy is starting a catering business and is attempting to figure out who she should be using to transport the food to different locations. She has found two trucking companies that are willing to make sure her food arrives intact. Peter's Pick Up charges \$0.40 per mile and charges a flat fee of \$68. Helen's Haulers charges \$0.65 per mile and charges a flat fee of \$23. If Wendy needs them to drive 500 miles per week, which is the better deal and by how much?

$$\begin{aligned}
 P &= 0.40m + 68 \\
 H &= 0.65m + 23 \\
 0.40(500) + 68 &= 268 \\
 0.65(500) + 23 &= 348 \\
 \text{Peter's is better by } \$80.
 \end{aligned}$$

Solve the systems of equations:

3.  $10x + 12y = 108$

$(-2x + 2y = 18) \cdot 5$

$(0, 9)$

$$\begin{aligned}
 10x + 12(9) &= 108 \\
 10x + 108 &= 108 \\
 10x &= 0 \\
 x &= 0
 \end{aligned}$$

$$\begin{aligned}
 10x + 12y &= 108 \\
 -10x + 10y &= 90 \\
 \hline
 2y &= 198 \\
 y &= 9
 \end{aligned}$$

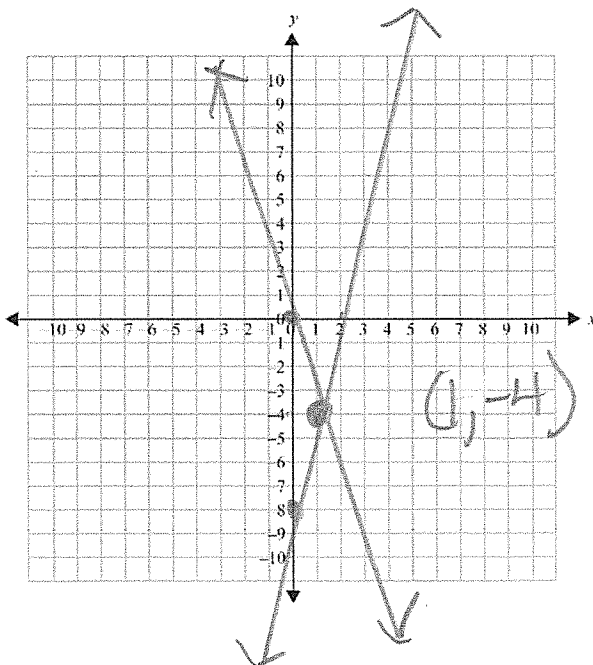
4.  $X = -6y$

$x = 20 - 8y$

$$\begin{aligned}
 -6y &= 20 - 8y \\
 +8y & \\
 \hline
 2y &= 20 \\
 y &= 10 \\
 X &= -6(10) \\
 X &= -60
 \end{aligned}$$

5. Graph the system of equations:

$Y = 4x - 8$     $Y = -4x$



$(-60, 10)$

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6. Is (2,3) a possible solution for  $x = 2/3y$  and  $x - 3x = y$ ?

$$\begin{aligned} x &= 2/3 y \\ 2 &= 2/3(3) \\ 2 &= 2 \end{aligned}$$

$$\begin{aligned} x - 3x &= y \\ -2x &= y \\ -2(2) &= 3 \\ -4 &\neq 3 \end{aligned}$$

NO!

7. The perimeter of a rectangle is 240 cm. The width is twice the length. Write a system to represent the situation.

$$\begin{aligned} 2L + 2W &= 240 \\ W &= 2L \end{aligned}$$



8. The difference between two numbers is 12. The sum of three times the smaller number and twice the larger numbers is 84. Write a system of equations to represent the situation.

$$\begin{aligned} y - x &= 12 \\ 3x + 2y &= 84 \end{aligned}$$

$x \rightarrow$  smaller number  
 $y \rightarrow$  larger number

9. Solve the system of equations:

$$\begin{aligned} y &= -3x + 5 \\ 5x - 4y &= -3 \end{aligned}$$

$$\begin{aligned} 5x - 4(-3x + 5) &= -3 \\ 5x + 12x - 20 &= -3 \\ 17x - 20 &= -3 \\ +20 &+20 \\ \hline 17x &= 17 \\ \hline x &= 1 \end{aligned}$$

$$\begin{aligned} y &= -3(1) + 5 \\ y &= -3 + 5 \\ y &= 2 \\ (1, 2) \end{aligned}$$

10. Solve the system of equations:

$$\begin{aligned} x - y &= 11 \\ 2x + y &= 19 \\ \hline -x &= 30 \\ \hline x &= -30 \end{aligned}$$

$$\begin{aligned} 2(10) + y &= 19 \\ 20 + y &= 19 \\ -20 &-20 \\ \hline y &= -1 \\ (10, -1) \end{aligned}$$

11. You are walking with your friends and decide to go on different paths to get to the park. The total distance for your friend is 3200 feet, but you are getting a 300 feet head start. If you walk 2 ft/sec and he walks 4ft/sec, who will get there first?

You  $\rightarrow 3200 - 300 = 2900$   
 $\frac{2900}{2} = 1450 \text{ sec}$

Friend  $\rightarrow \frac{3200}{4} = 800 \text{ sec}$

Your friend will.