Section 2 - Topic 9 Systems of Linear Equations in Three Variables – Part 1

Suppose I have only quarters in my pocket. If I have 75 cents in change, can you tell me how many quarters are in my pocket?

Define a variable to represent the number of quarters.

Write an equation that models this situation.

 $_{,2}5_{g} = ,75$ Solve the equation to find the number of quarters in my pocket.

Suppose I have only quarters and dimes in my pocket. If I have \$1.50 in change, can you tell me how many quarters and dimes are in my pocket?

Suppose you have 9 coins in your pocket. How many are quarters? How many are dimes?

Define variables to represent the number of quarters and dimes.

9=quarters d=dimes

Write a system of equations that models this situation.

$$(q+d=9)=-100$$

,25q+,10d=1.50

Solve the system to find the number of quarters and dimes in my pocket.

$$-.10q -.10d = -.9$$
 $.15q = .6$
 $.25q + .10d = 1.50$ $.15 = 4 quarters$
 $.15 = 5 dimes$

If we are going to solve a system with **3** unknowns, how many equations must we have?

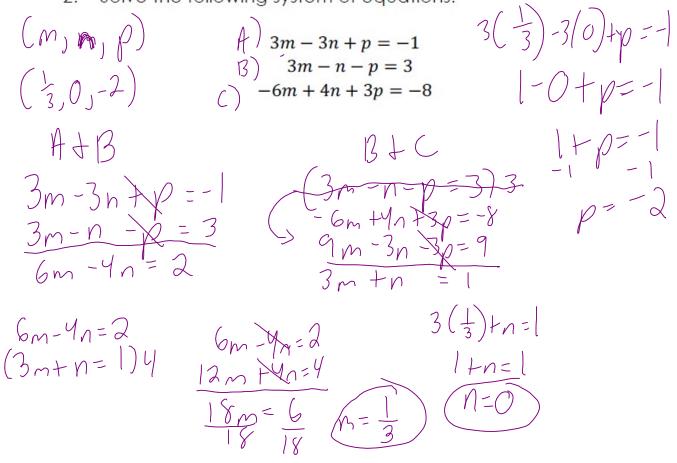
three

Let's Practice!

1. Solve the following system of equations.
$$(a, b, c)$$

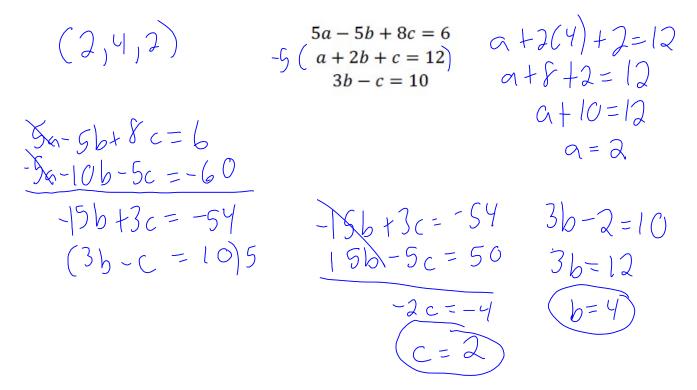
 $a+b-3c = -7$
 $3b+c = -8$
 $(-1, -3, 1)$
 $3b+l = -8$
 $-1 - 1$
 $3b = -9$
 $3b = -9$
 $3b = -7$
 $-6 = -7$
 $+6 + 6$
 $0 = -1$

2. Solve the following system of equations.



Try It!

3. Solve the following system of equations:



Section 2 – Topic 10 Systems of Linear Equations in Three Variables – Part 2

Let's Practice!

 An arena has 49,000 seats that sell for \$25 on the ground level, \$20 on the mid-level, and \$15 on the upper-level. The number of seats on the upper-level equals the total number of seats on the ground level and mid-level combined. Suppose the arena brings in \$882,500 from a sold-out event. How many seats does each level hold?

Define variables to represent the number of seats in each level.

g=ground v=vper m=midlellel

Write a system of equations that models this situation.

$$g + m + v = 49,000$$
 $25g + 20m + 15v = 882,500$
 $v = g + m$

Use the system of equations to find the solution.

$$g + m + (g + m) = 49,000$$

$$25g + 20m + 15(g + m) = F82,500$$

$$(2g + 2m = 44,000) - 20 - 40g - 40m = -980,000$$

$$40g + 35m = 882,500$$

$$40g + 35m = 882,500$$

$$2g + 39,000 = 49,000$$

$$g = 19,500$$

$$m = 19,500$$

$$34,500 + 0 = 49,000$$

$$g = 5,000$$

$$g = 5,0$$

Try It!

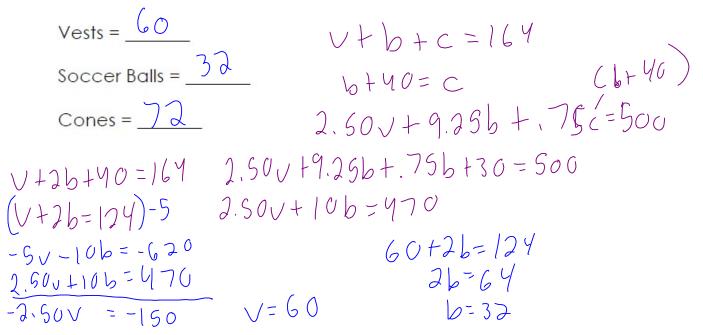
- 2. SaraBeth is making custom jewelry to sell at the school carnival. She purchased round beads for 3 cents each, teardrop shaped beads for 5 cents each, and heart-shaped beads for 6 cents each. She bought twice as many round beads as heart shaped beads. SaraBeth bought a total of 450 beads and spent \$18.75.
 - a. Write a system of three equations that models how many beads of each type SaraBeth bought and the total amount she spent.

r + t + h = 450.03 r +.05 t +.06 h = 18,75 r = 2h b. Solve your system using any method.

c. How many of each type of bead did SaraBeth purchase?

BEAT THE TEST!

 The school athletic director had a budget of \$500 to purchase 164 items for the soccer team. She purchased vests for \$2.50 each, soccer balls for \$9.25 each, and cones for \$0.75 each. She purchased 40 more cones than balls. How many of each item can she purchase?



solving systems of equations with three variables topics 9 and 10 10-10 - 10-1 (Dp 80 beter b5), 02/019