

SOLVING SYSTEMS WORD PROBLEMS

- Write a system of linear equations to model each problem.
- Choose a method and solve the system.

1) 480 people attended a concert. Pavilion seats cost \$35 and lawn seats sold for \$25. A total of \$15,200 was collected. How many seats of each kind were sold?

P = # of pavillion seats
 L = # of lawns seats

$$\begin{aligned}
 -25(P + L = 480) &\rightarrow -25P - 25L = 12000 \\
 35P + 25L = 15200 &\rightarrow \frac{35P + 25L = 15200}{\frac{10P}{10} = \frac{3200}{10}} \\
 &P = 320
 \end{aligned}$$

$$\begin{aligned}
 320 + L &= 480 \\
 L &= 160
 \end{aligned}$$

320 Pavillion
 160 Lawn

2) Ms. Kernodle is giving a 44 question test worth 100 points. Some questions are worth two points. The remaining questions are worth 4 points. How many of each type of question are on the test?

X = 2 pt. Qs
 Y = 4 pt. Qs

$$X + Y = 44 \rightarrow Y = 44 - X$$

$$2X + 4Y = 100$$

$$2X + 4(44 - X) = 100$$

$$2X + 176 - 4X = 100$$

$$\frac{-2X = -76}{-2 \quad \nearrow}$$

$$X = 38 \quad Y = 6$$

38 2-pt questions
 6 4-pt questions

3) The larger of two numbers is 1 more than twice the smaller. The sum of the numbers is 20 less than three times the larger. Find the numbers.

X = larger
 Y = smaller

$$X = 2Y + 1$$

$$X + Y = 3X - 20$$

$$Y = 2X - 20$$

~~$$X = 2Y + 1$$~~

$$Y = 2(13) - 20$$

$$Y = 6$$

$$X = 2(2X - 20) + 1$$

$$X = 4X - 40 + 1$$

$$\frac{-4X - 4X}{-3X} = \frac{-39}{-3}$$

$$X = 13$$

13 and 6

4) A DVD costs \$6 more than a CD. Colin bought two CDs and 3 DVDs for \$59.50. How much does a CD cost? How much does a DVD cost?

$$D = C + 6$$

$$2C + 3D = 59.50$$

$$2C + 3(C + 6) = 59.50$$

$$2C + 3C + 18 = 59.50$$

$$\frac{5C}{5} = \frac{41.50}{5} \quad C = 8.30$$

$$\begin{array}{r} 8.30 \\ 5 \overline{) 41.50} \\ \underline{40} \\ 1.50 \\ \underline{1.50} \\ 00 \end{array}$$

$$D = 8.30 + 6$$

$$D = 14.30$$

CD's: \$8.30
DVD's: \$14.30

5) A piggy bank contains a total of 84 coins in nickel and quarters worth \$12.80 altogether. How many of each type of coin are in the piggy bank?

$$-5(N + Q = 84) \rightarrow -5N - 5Q = -420$$

$$100(0.05N + 0.25Q = 12.80) \rightarrow 5N + 25Q = 1280$$

$$\begin{array}{r} 20Q = 860 \\ \underline{20} \quad \underline{20} \end{array}$$

$$Q = 43$$

$$N + 43 = 84$$

$$N = 41$$

41 Nickels → \$2.05
43 Quarters → \$10.75