Writing Word Problems as Systems of Equations & Solving

1. Let x = first #
   Let y = second #

$$x + y = -11$$
$$2x - y = 32$$
$$\frac{3x}{3} = \frac{21}{3}$$
$$x = 7$$

$$x + y = -11$$
$$7 + y = -11$$
$$-7 \quad -7$$
$$y = -18$$

The numbers are 7 and -18

2. Let x = # of nickels
   Let y = # of dimes

$$0.1[x + y = 42] \Rightarrow 0.1x + 0.1y = 4.2$$
$$0.05x + 0.1y = 3.3$$
$$0.05x = 0.9$$
$$x = 18$$

$$x + y = 42$$
$$18 + y = 42$$
$$-18 \quad -18$$
$$y = 24$$

18 nickels and 24 dimes

3. Let x = # of adult tickets
   Let y = # of child tickets

$$35[x + y = 548] \Rightarrow 3.5x + 3.5y = 1918$$
$$6.5x + 3.5y = 2881$$
$$\frac{3x}{3} = \frac{963}{3}$$
$$x = 321$$

$$x + y = 548$$
$$321 + y = 548$$
$$-321 \quad -321$$
$$y = 227$$

321 adult tickets and 227 child tickets

4. Let w = width of the field (ft)
   Let l = length of field (ft)

$$2l + 2w = 110$$
$$l = 2w + 7$$

$$2(2w + 7) + 2w = 110$$
$$4w + 14 + 2w = 110$$
$$6w + 14 = 110$$
$$-14 \quad -14$$
$$\frac{6w}{6} = \frac{96}{6}$$
$$w = 16$$

$$l = 2w + 7$$
$$l = 2(16) + 7$$
$$l = 32 + 7$$
$$l = 39$$

Length = 39 feet
Width = 16 feet

5. Let x = # of adult tickets
   Let y = # of child tickets

$$2[x + y = 380] \Rightarrow 2x + 2y = 760$$
$$4x + 2y = 1320$$
$$\frac{2x}{2} = \frac{560}{2}$$
$$x = 280$$

$$x + y = 380$$
$$280 + y = 380$$
$$-280 \quad -280$$
$$y = 100$$

280 Adult tickets and 100 Children tickets

6. Let v = # of students in a van
Let b = # of students in a bus

$$\begin{aligned} 8v + 8b &= 240 \\ 2[4v + 16 &= 54] \end{aligned} \Rightarrow \begin{aligned} 8v + 8b &= 240 \\ 8v + 2b &= 108 \end{aligned}$$

$$\frac{6b}{6} = \frac{132}{6}$$

$$b = 22$$

$$\begin{aligned} 4v + b &= 54 \\ 4v + 22 &= 54 \\ -22 & \quad -22 \end{aligned}$$

$$\frac{4v}{4} = \frac{32}{4}$$

$$v = 8$$

22 students/bus and 8 students/van

7. Let x = # of calories in an orange
Let y = # of calories in a banana

$$x + 20 = y$$
$$7y = 9x$$

$$\begin{aligned} 7(x+20) &= 9x \\ 7x + 140 &= 9x \\ -7x & \quad -7x \end{aligned}$$

$$\frac{140}{2} = \frac{2x}{2}$$

$$70 = x$$

$$\begin{aligned} x + 20 &= y \\ 70 + 20 &= y \\ 90 &= y \end{aligned}$$

There are 90 calories in a banana

8. Let x = the cost of a pizza ($)
Let y = the cost of a soda ($)

$$\begin{aligned} 3[4x + 10y &= 63] \\ 4[3x + 8y &= 48] \end{aligned} \Rightarrow$$

$$\begin{aligned} 12x + 30y &= 189 \\ 12x + 32y &= 192 \end{aligned}$$

$$\frac{2y}{2} = \frac{3}{2}$$

$$y = 1.5$$

$$4x + 10y = 63$$
$$4x + 10(1.5) = 63$$
$$4x + 15 = 63$$
$$-15 \quad -15$$

$$\frac{4x}{4} = \frac{48}{4}$$

$$x = 12$$

One Pizza costs $12

What Does Cate Often Call Her Twin Sister?

What Does Cate Often Call Her Twin Sister?

1. $(1, 4)$
2. $(2, -3)$
3. $(-2, 1)$
4. $(5, -2)$
5. $(3, 1)$
6. $(-1, -3)$
7. $(-2, 4)$
8. $(5, 0)$
9. $(-2, -5)$
10. $(0, -4)$
11. $(2, -1)$
12. $(4, 3)$
13. 65 chickens, 35 pigs

DUPLICATE

8.5