

## Section 4.4 Word Problems

ex: How do the quarter pounder and Whopper with cheese measure up in calories? Two quarter pounders and 3 whoppers with cheese provide 2607 calories. One of each provides 1009 calories. Find the caloric content of each item.

$$x = \# \text{ of calories in a QP} = 420 \text{ calories}$$

$$y = \# \text{ of calories in a Whopper} = 589 \text{ calories}$$

$$-2(x+y = 1009) \Rightarrow -2x - 2y = -2018$$

$$2x + 3y = 2607 \Rightarrow \underline{2x + 3y = 2607}$$

$$y = 589$$

$$\begin{array}{r} x + 589 = 1009 \\ -589 \quad -589 \\ \hline x = 420 \end{array}$$

ex: #12 p301

$$x = \text{cost of tablecloth} = \$12$$

$$y = \text{cost of napkin} = \$2$$

$$8x + 5y = 106$$

$$-8(x + 6y = 24)$$

$$\underline{8x + 5y = 106}$$

$$\underline{-8x - 48y = -192}$$

$$x + 6 \cdot 2 = 24$$

$$x + 12 = 24$$

$$x = 12$$

$$\underline{-43y = -86}$$

$$\underline{-43} \quad \underline{-43}$$

$$y = 2$$

ex: You inherited \$5000 with the stipulation that the money had to be invested the first year in accounts earning 9% and 11%. How much did you invest at each rate if total interest was \$487?

$$x = \text{9\% investment} = \$3150$$

$$y = \text{11\% investment} = \$1850$$

$$-11(x + y = 5000) \Rightarrow -11x - 11y = -55000$$

$$100(.09x + .11y = 487) \Rightarrow \underline{9x + 11y = 48700}$$

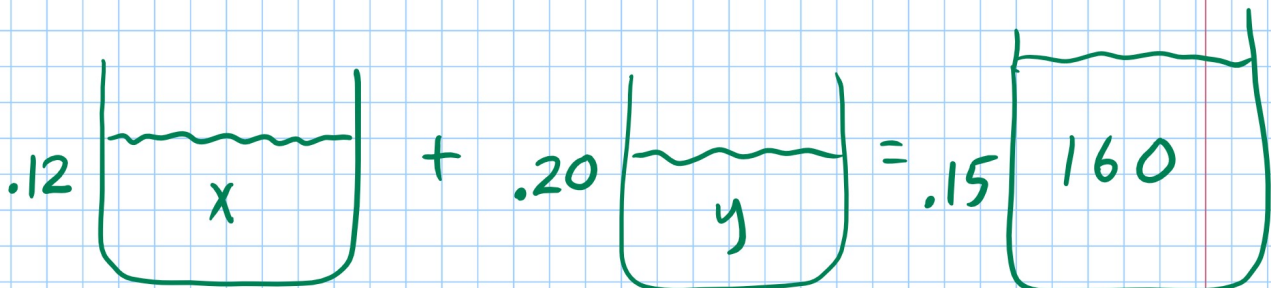
$$\begin{array}{r} -2x \\ -2 \end{array} = \begin{array}{r} -6300 \\ -2 \end{array}$$

$$x = 3150$$

$$3150 + y = 5000$$

$$y = 1850$$

ex: A chemist needs to mix a 12% acid solution with a 20% acid solution to obtain 160 ounces of a 15% acid solution. How many ounces of each acid solutions must be used?



$$-12(x + y = 160) \Rightarrow -12x - 12y = -1920$$

$$100(.12x + .2y = .15 \cdot 160) \Rightarrow \underline{12x + 20y = 2400}$$

$$x + 60 = 160$$

$$x = 100$$

100 ounces of 12%  
60 ounces of 20%

$$\frac{8y}{8} = \frac{480}{8}$$

$$y = 60$$