

Attach any work!

\* Underline or highlight important information!

Problem 6-103.

a. Hong Kong's tallest building, Two International Finance Center, is 88 stories tall. The former Sears Tower in Chicago is eight stories taller than the Empire State Building in New York City. If all of the buildings were stacked on top of each other, the combined heights would have 300 stories. How many stories does the Sears Tower have?

$$\begin{aligned} \text{Empire} &= \frac{102}{x+8} \\ \text{Sears} &= \frac{110}{x} \\ \text{IFC} &= \frac{88}{x} \\ \text{total} &= \frac{300}{x} \end{aligned}$$

**EQUATION**  
 expression:  $88 + x + 8 + x = 300$

$$\begin{array}{r} 96 + 2x = 300 \\ -96 \\ \hline 2x = 204 \end{array}$$

$$\begin{array}{r} x = \text{Empire st.} \\ x+8 = \text{Sears} \\ 88 = \text{IFC} \end{array}$$

$$\begin{array}{r} 2x = 204 \\ \hline x = 102 \end{array}$$

Problem 6-103.

b. The Mackinac Bridge in Michigan is 1158 meters long. The Tsing Ma Bridge in Hong Kong is 97 meters longer than the Golden Gate Bridge in California. Together, all three bridges have a length of 3815 meters. How long is the Tsing Ma

Bridge?

$$x = \text{Golden Gate}$$

$$\frac{x+97}{1158} = \frac{\text{Tsing Ma}}{\text{Mac}}$$

$$\frac{x+97}{1158} = \frac{\text{Mac}}{\text{Mac}}$$

$$\begin{aligned} \text{Golden Gate} &= 1280 \\ \text{Mackinac} &= 1158 \\ \text{Tsing Ma} &= 1377 \\ \text{total} &= 3815 \end{aligned}$$

Equation  
Expression:

$$3815 = 1158 + x + 97 + x$$

$$3815 = 1255 + 2x$$

$$-1255 \quad -1255$$

$$\frac{2560}{2} = \frac{2x}{2}$$

$$1280 = x$$



Problem 6-103.

c. The highest elevation in Delaware is 106 feet higher than the highest elevation in Florida. Louisiana's highest elevation is 190 feet higher than Florida's highest elevation. If you climbed from sea level to the highest points in Delaware, Florida, and Louisiana, you would only climb 1331 feet. How high is the highest elevation in each of the three states?

$$\begin{array}{r} \text{Delaware} = x + 106 = 451 \\ \text{Louisiana} = x + 190 = 535 \\ \text{Florida} = x = 345 \\ \hline \text{total } 1331 \text{ ft.} \end{array}$$

equation expression:

$$\begin{array}{r} 1331 = (x + 106) + (x + 190) + x \\ 1331 = 3x + 296 \\ \underline{-296} \\ 1035 = 3x \\ \underline{\quad} \\ 345 = x \end{array}$$

Problem 6-103.

d. Most states in the United States are divided into counties. Some counties are very large, while some are very small. Different states have different numbers of counties. Pennsylvania has five less than twice as many counties as Oregon. Florida has one less county than Pennsylvania. Together, the three states have 169 counties. How many counties does each of these three states have?

$$\begin{aligned} \text{Oregon} &= x \\ \text{Penn} &= 2x - 5 \\ \text{Florida} &= (2x - 5) - 1 \end{aligned}$$

$$\begin{array}{r} 169 = x + 2x - 5 + (2x - 5) - 1 \\ 169 = 5x - 11 \\ +11 \\ \hline 180 = 5x \\ 36 = x \end{array}$$

$$\begin{array}{r} \text{Oregon} = 36 \\ \text{Penn} = 67 \\ \text{Florida} = 66 \\ \hline \text{total } 169 \end{array}$$