

Other unit conversions may require multiplying by known constants along with conversion factors.

For example:

1. Converting  $3.5 \text{ ft}^3/\text{sec}$  to MGD:

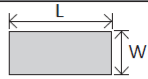



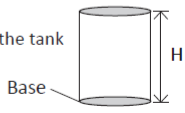
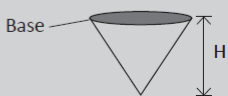
$$\frac{3.5 \cancel{\text{ft}^3}}{\cancel{\text{sec}}} * \frac{7.48 \cancel{\text{gal}}}{\cancel{\text{ft}^3}} * \frac{\text{MG}}{10^6 \cancel{\text{gal}}} * \frac{1440 * 60 \text{ sec}}{\text{day}} = 2.3 \text{ MGD}$$

2. Converting 1,000 L water to lbs:

$$1000 \cancel{\text{L}} * \frac{\cancel{\text{gal}}}{3.785 \cancel{\text{L}}} * \frac{8.34 \text{ lbs}}{\cancel{\text{gal}}} = 2,203 \text{ lbs}$$

(Note : 8.34 lbs/gal is density of water – a constant)

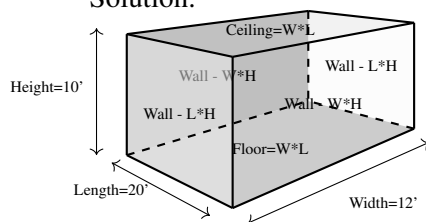
## 4.2 Area & Volume

Perimeter (P)/Circumference (C)	
<b>Rectangle:</b> $P [\text{ft}] = 2L [\text{ft}] + 2W [\text{ft}]$ where L = length and W = width	
<b>Circle:</b> $C [\text{ft}] = \pi \times D [\text{ft}]$ where $\pi$ = constant = 3.1415; and D = diameter	
Area (A)	
<b>Rectangle:</b> $A [\text{ft}^2] = L [\text{ft}] \times W [\text{ft}]$ where L = Length and W = Width	
<b>Circle:</b> where $\pi$ = constant = 3.1415; D = diameter $A [\text{ft}^2] = \frac{1}{4} \times \pi \times D^2 [\text{ft}^2]$	
Volume (V)	
<b>Regular Prism:</b> $V [\text{ft}^3] = A_{\text{base}} [\text{ft}^2] \times H [\text{ft}]$ where $A_{\text{base}}$ is the area of the base; and H is the height or depth of the tank	
<b>Cone:</b> $V [\text{ft}^3] = \frac{1}{3} A_{\text{base}} [\text{ft}^2] \times H [\text{ft}]$	

### 4.2.1 Example Problems

1. The floor of a rectangular building is 20 feet long by 12 feet wide and the inside walls are 10 feet high. Find the total surface area of the inside walls of this building

Solution:



$$\begin{aligned}
 2 \text{ Walls } W*H + 2 \text{ Walls } L*H &= 2 * 12 * 10 \text{ ft}^2 + 2 * 20 * 10 \text{ ft}^2 \\
 &= 240 + 400 = \boxed{640 \text{ ft}^2}
 \end{aligned}$$