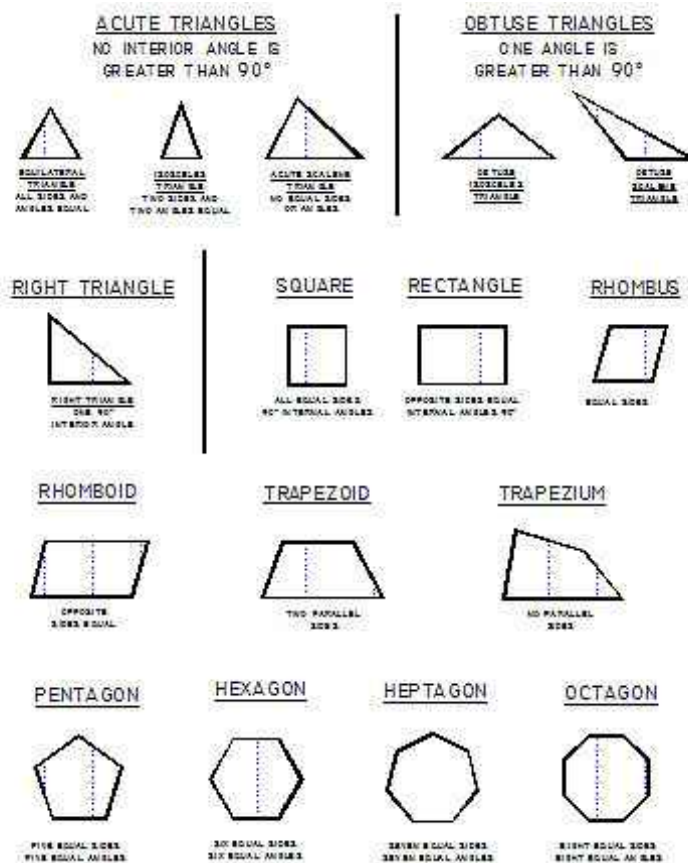


**TERMS TO BE DEFINED OR IDENTIFIED for COMPETENCY 14:**

- Quadrilateral
- Trapezoid
- Pentagon
- Hexagon
- Perimeter
- Circumference
- Common denominator
- Area formulas for geometric shapes
- Volume formulas
- Algebraic formulas
- Trigonometric formulas
- Metric
  - Centimeters
  - Millimeters
  - Meters

**ITEMS TO BE REVIEWED for COMPETENCY 14:**



## METRIC SYSTEM

- **ASME** (American Society of Mechanical Engineers) states the **SI** (International system of Units) linear unit is commonly Millimeters.

### **Metric to Metric Equivalents**

10 millimeters = 1 centimeter

10 centimeters = 1 decimeter

10 decimeters = 1 meter

10 meters = 1 dekameter

100 dekameter = 1 kilometer

1000 millimeters = 1 meter

1000 meters = 1 kilometer

### **Inch to Millimeter Conversion:**

Multiply inches by 25.4

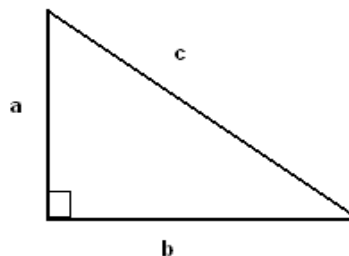
to convert inches to millimeters.

## **VOLUME FORMULAS:**

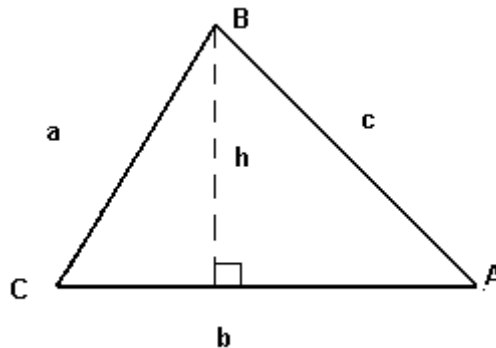
### **Right Triangle and Pythagora's theorem**

Pythagora's theorem: The two sides **a** and **b** of a right triangle and the hypotenuse '**c**' are related by

$$a^2 + b^2 = c^2$$



**Area and Perimeter of Triangle**



**Perimeter =  $a + b + c$**

There are several formulas for the area.

If the base  $b$  and the corresponding height  $h$  are known, we use the formula

**Area =  $(1 / 2) * b * h$ .**

If two sides and the angle between them are known, we use one of the formulas, depending on which side and which angle are known

**Area =  $(1 / 2) * b * c \sin A$**

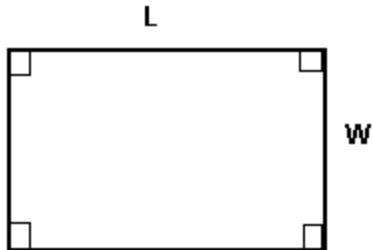
**Area =  $(1 / 2) * a * c \sin B$**

**Area =  $(1 / 2) * a * b \sin C$  .**

If all three sides are known, we may use **Heron's formula** for the area.

**Area =  $\text{sqrt} [ s(s - a)(s - b)(s - c) ]$  , where  $s = (a + b + c)/2$ .**

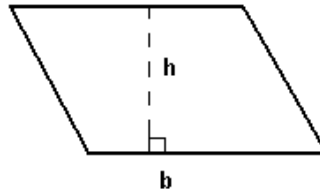
**Area and Perimeter of Rectangle**



$$\text{Perimeter} = 2L + 2W$$

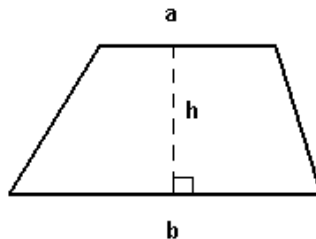
$$\text{Area} = L * W$$

**Area of Parallelogram**



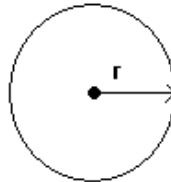
$$\text{Area} = b * h$$

**Area of Trapezoid**



$$\text{Area} = (1 / 2)(a + b) * h$$

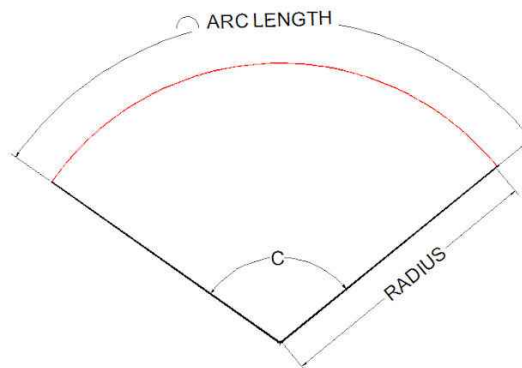
**Circumference of a Circle and Area of a Circular Region**



$$\text{Circumference} = 2 \cdot \pi \cdot r$$

$$\text{Area} = \pi \cdot r^2$$

**Arc length and Area of a Circular Sector**



$$\text{arc length} = 2\pi R \left( \frac{C}{360} \right)$$

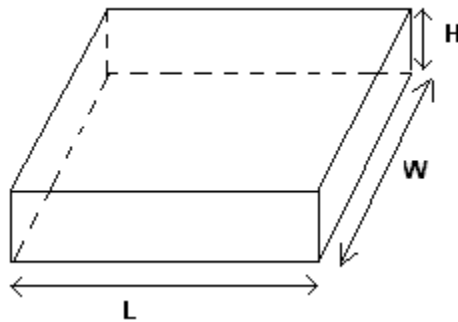
where:

$C$  is the **central angle** of the arc in degrees

$R$  is the radius of the arc

$\pi$  is **Pi**, approximately 3.142

**Volume and Surface Area of a Rectangular Solid**



$$\text{Volume} = L * W * H$$

$$\text{Surface Area} = 2(L * W + H * W + H * L)$$

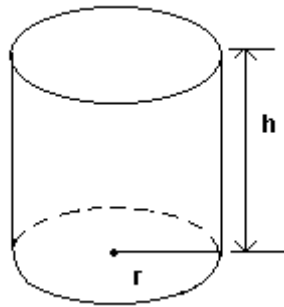
**Volume and Surface Area of a Sphere**



$$\text{Volume} = (4/3) * \text{Pi} * r^3$$

$$\text{Surface Area} = 4 * \text{Pi} * r^2$$

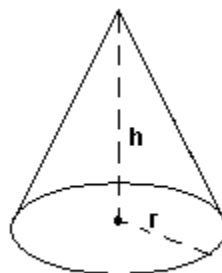
**Volume and Surface Area of a Right Circular Cylinder**



$$\text{Volume} = \text{Pi} * r^2 * h$$

$$\text{Surface Area} = 2 * \text{Pi} * r * h$$

**Volume and Surface Area of a Right Circular Cone**



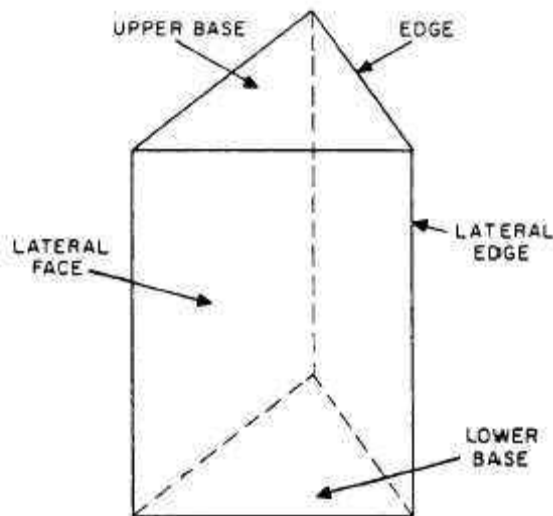
$$\text{Volume} = (1/3) * \text{Pi} * r^2 * h$$

$$\text{Surface Area} = \text{Pi} * r * \text{sqrt}(r^2 + h^2)$$

### Volume of a Prism

The volume of a prism measures the amount of space taken up by that prism. The general formula for calculating the volume of a prism is very simple:

$$V=Bh$$

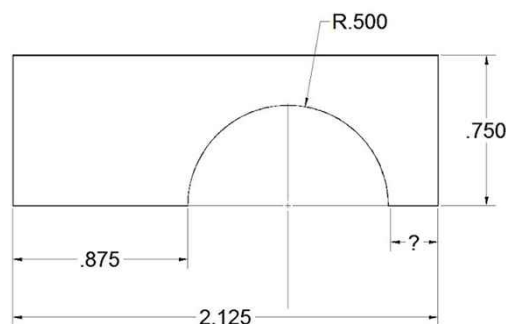


where  $B$  is the area of the base and  $h$  is the height.

### SAMPLE REVIEW QUESTIONS

1. For the drawing shown, calculate the missing dimension indicated by the “?”

- .250
- .500
- .516
- .750
- .875



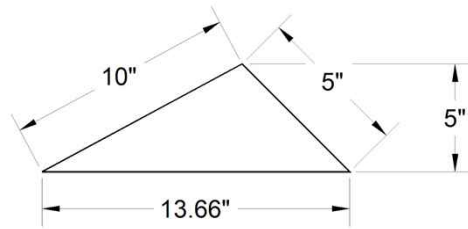


2. A trapezoid is a figure that has?

Two sides parallel  
Four equal sides  
Five sides  
Two pair of parallel sides

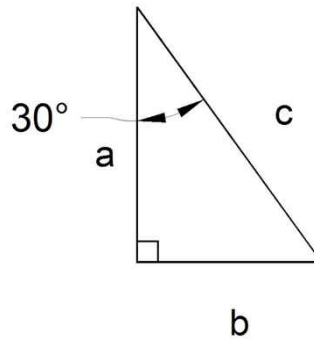
3. Calculate the area of the triangle. (MCD-CO14-G138)

34.15 sq/in  
68.3 sq/in  
25 sq/in  
33.66 sq/in



4. If the length of side 'b' of the triangle shown is 2.5in, what is the length of side 'a'?

4.33 in  
5 in  
6.25 in  
6 in



5. Solve the problem given. Reduce to lowest terms.

1-9/64  
1-9/32  
1-3/8  
1-5/16

$$\frac{3}{10} + \frac{9}{10} + \frac{1}{4}$$