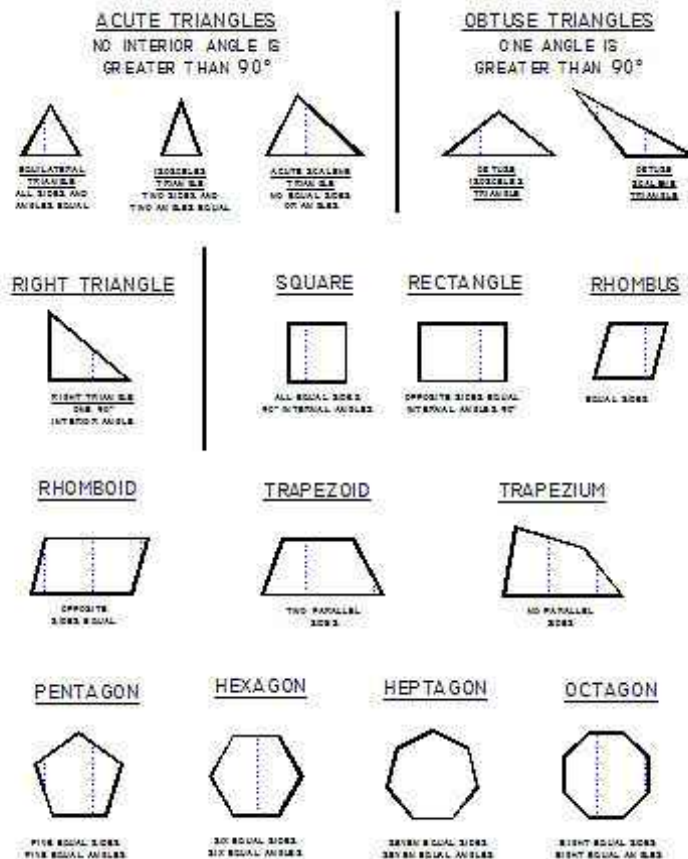


TERMS TO BE DEFINED OR IDENTIFIED FOR COMPETENCY 13:

- 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 13:



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:

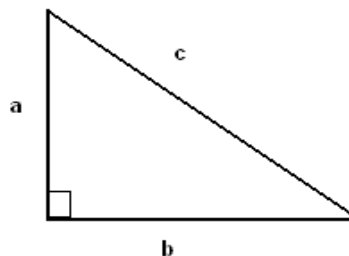
Multiply inches by 25.4
to convert inches to millimeters.

VOLUME FORMULAS:

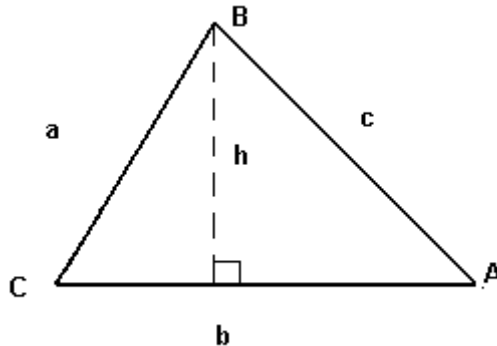
Right Triangle and Pythagora's theorem

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

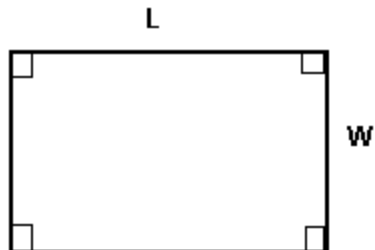
Area = $(1 / 2) * a * c \sin B$

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 $s = (a + b + c)/2$.

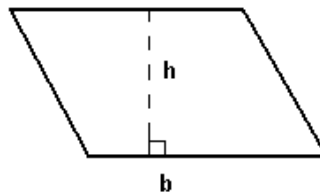
Area and Perimeter of Rectangle



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

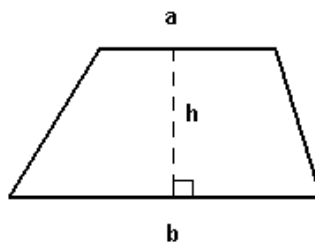
$$\text{Area} = L * W$$

Area of Parallelogram



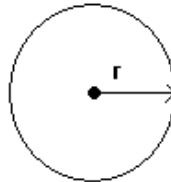
$$\text{Area} = b * h$$

Area of Trapezoid



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

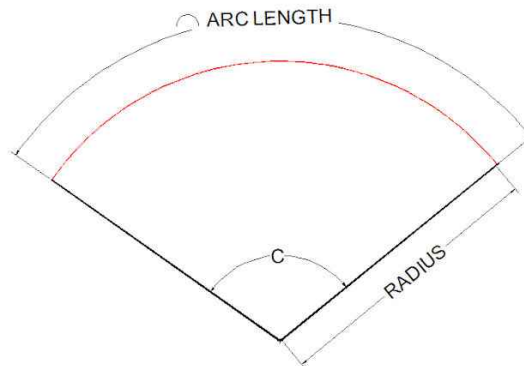
Circumference of a Circle and Area of a Circular Region



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

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

Arc length and Area of a Circular Sector



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

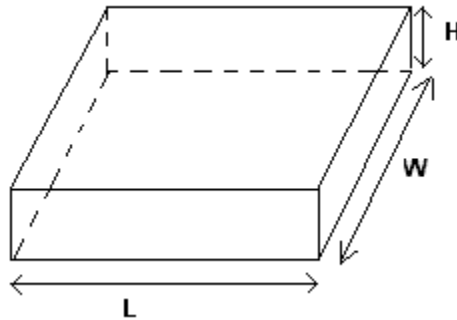
where:

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

R is the radius of the arc

π is **Pi**, approximately 3.142

Volume and Surface Area of a Rectangular Solid



Volume = $L \cdot W \cdot H$

Surface Area = $2(L \cdot W + H \cdot W + H \cdot L)$

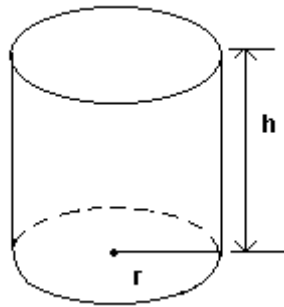
Volume and Surface Area of a Sphere



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

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

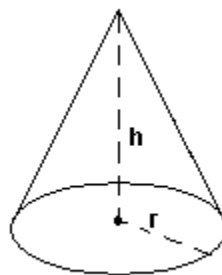
Volume and Surface Area of a Right Circular Cylinder



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

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

Volume and Surface Area of a Right Circular Cone



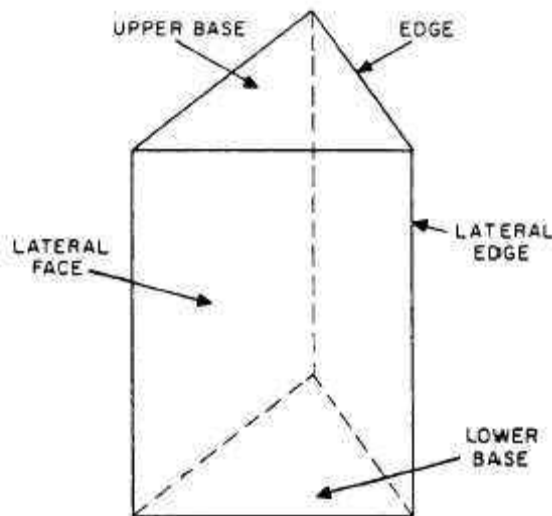
$$\text{Volume} = (1/3) * \text{Pi} * r^2 * h$$

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

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:

$$V=Bh$$

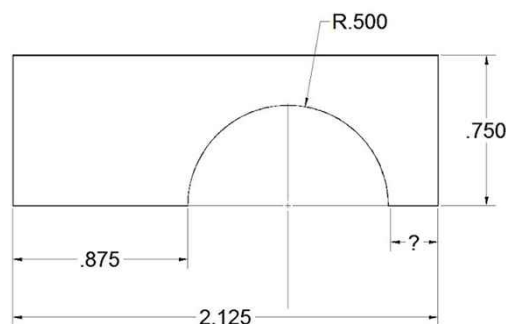


where B is the area of the base and h is the height.

SAMPLE REVIEW QUESTIONS

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

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

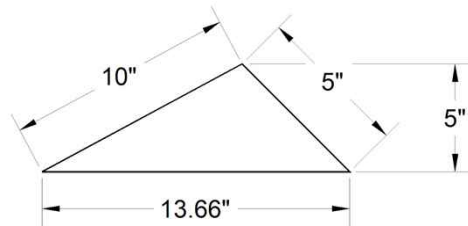


2. A trapezoid is a figure that has?

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

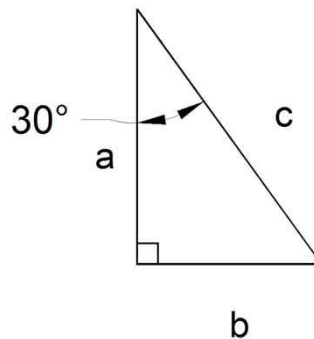
3. Calculate the area of the triangle. (MCD-CO14-G138)

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

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