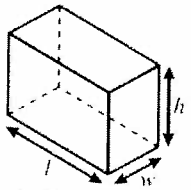
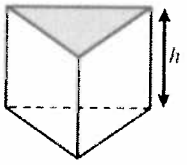
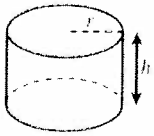
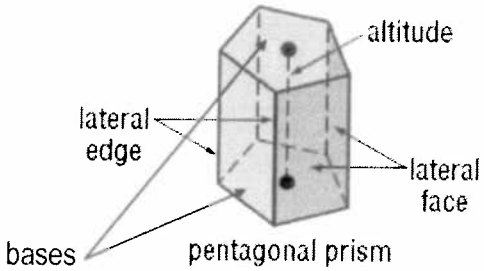
Master 6

12-2 & 12-4 Surface Area & Volume of Prisms & Cylinders

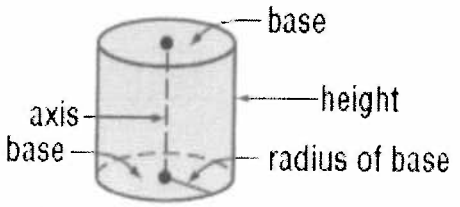
RECTANGULAR PRISM	ANY TYPE OF PRISM	CYLINDER
		
$V = lwh$ $S.A. = 2lw + 2lh + 2wh$	$V = Bh$ $L.A. = hp$ $S.A. = L.A. + 2B$	$V = \pi r^2 h$ $L.A. = 2\pi rh$ $S.A. = 2\pi r^2 + 2\pi rh$
l = prism's base length **w** = prism's base width **h** = prism's height	**p** = Base's Perimeter **B** = Base's Area **h** = prism's height	**r** = radius of the Base **h** = prism's height
Lateral Area – sum of areas of all lateral faces	**Surface Area** - the total of the areas of all faces	**Volume** - the number of cubic units in the interior

Parts of a Prism:



- Polyhedron with 2 parallel and ≅ bases.
- It is named by the shape of its base
- Right – each lateral edge is _____ to both bases.
- Oblique – lateral edge is not ⊥ to both bases.

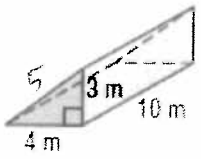
Parts of a cylinder:



- A solid with 2 parallel and ≅ circular bases.
- Height - perpendicular distance between the bases
- The height is equal to the axis of rotation.
- Oblique – axis is not ⊥ to both bases.

1-4: Find the Lateral Area, Surface Area, and Volume of each.

1.



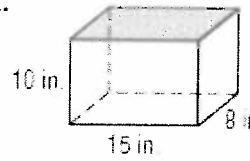
$P = 3+4+5 = 12$
$B = \frac{1}{2}(3)(4) = 6$

LA: $h\ p$ $10(12) = 120\ m^2$

SA: $LA + 2B$ $120 + 2(6) = 132\ m^2$

V: Bh $6(10) = 60\ m^3$

2.



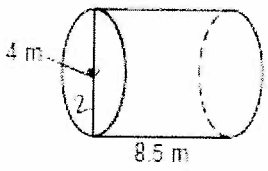
$P = 2(15) + 2(8) = 46$
$B = (15)(8) = 120$

LA: hp $10(46) = 460\ in^2$

SA: $LA + 2B$ $460 + 2(120) = 700\ in^2$

V: Bh $120(10) = 1200\ in^3$

4.



LA: $2\pi rh$ $2\pi(2)(8.5) = 106.8\ m^2$

SA: $2\pi r^2 + 2\pi rh$ $2\pi(2)^2 + 2\pi(2)(8.5) = 131.9\ m^2$

V: $\pi r^2 h$ $\pi(2)^2(8.5) = 106.8\ m^3$

Master 8

12-3 & 12-5 Surface Area & Volume of Pyramids & Cones

PYRAMID

$V = \frac{1}{3}Bh$

$L.A. = \frac{1}{2}lp$

$S.A. = \frac{1}{2}lp + B$

p – Perimeter of the base
l – slant height (height of the lateral face)
h – Height of the pyramid
B - Base area

CONE

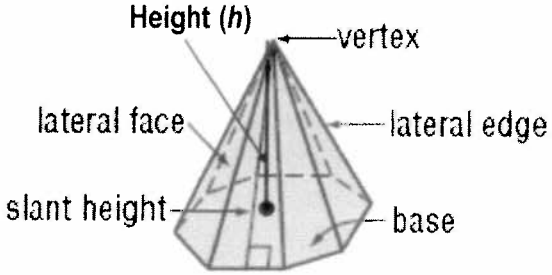
$V = \frac{1}{3}\pi r^2 h$

$L.A. = \pi rl$

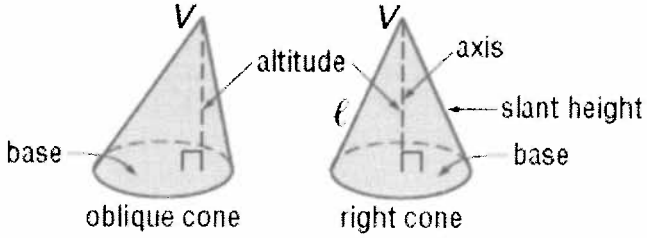
$S.A. = \pi r^2 + \pi rl$

r – radius of the circular base
l – slant height
h – height of the cone

Parts of a Pyramid:



Parts of a Cone:



Polyhedron - the base is a polygon

Regular Pyramid - the base is regular

A pyramid is named by its base

Lateral Faces – will all be isosceles triangles.

Total Edges – Sum of lateral & base edges

The difference between the cone & the pyramid is:

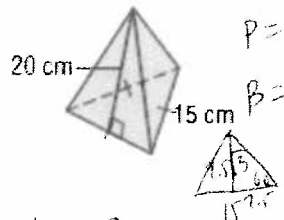
The base is always a circle!

Height - perpendicular distance between the base and vertex.

Slant Height - the height of the triangular lateral face.

1-4: Find the Lateral Area, Surface Area, and Volume of each.

3.



$P = 15.3 = 45$

$B = \frac{1}{2}(15)(15\sqrt{3})$

97.4

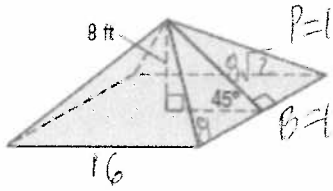
LA: $\frac{1}{2}lP$ $\frac{1}{2}(20)(45) = 450\ cm^2$

SA: $\frac{1}{2}lP + B$ $450 + 97.4 = 547.4\ cm^2$

V: OMIT THIS PROBLEM!

$20^2 = h^2 + 7.5^2$ $h = \sqrt{343.75} = 18.5$

2.



$P = 16.4$ 64

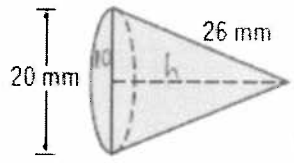
$B = 16^2 = 256$

LA: $\frac{1}{2}lP$ $\frac{1}{2}(8\sqrt{2})(64) = 362.0\ ft^2$

SA: $\frac{1}{2}lP + B$ $362.0 + 256 = 618.0\ ft^2$

V: $\frac{1}{3}Bh = \frac{1}{3}(256)(8) = 682.7\ ft^3$

3.



$10^2 + h^2 = 26^2$ $h^2 = 576$ $h = 24$

LA: πrl $\pi(10)(26) = 816.8\ mm^2$

SA: $\pi r^2 + \pi rl$ $\pi(10)^2 + \pi(10)(26) =$ $1131.0\ mm^2$

V: $\frac{1}{3}\pi r^2 h = \frac{1}{3}\pi(10)^2(24)$ $2513.3\ mm^3$