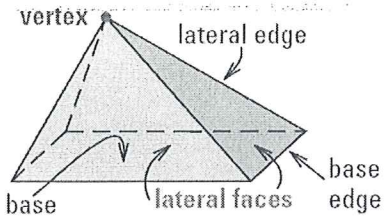
Acc Geometry
Surface Area of Pyramids- Notes

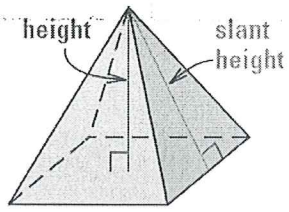
Key

Prior to lesson:
Pages: 1-4 Cut out and find the area
http://www.misd.net/mathematics/ImplementingGeometryUnits/3Dimensional/Netspyramidsandprisms.pdf
Put all work on the work sheet:
http://www.misd.net/mathematics/ImplementingGeometryUnits/3Dimensional/pyramids.pdf

A **pyramid** is a polyhedron in which the *base* is a polygon and the *lateral faces* are triangles with a common *vertex*. The intersection of two lateral faces is a *lateral edge*. The intersection of the base and a lateral face is a *base edge*. The *altitude*, or *height*, of the pyramid is the perpendicular distance between the base and the vertex.



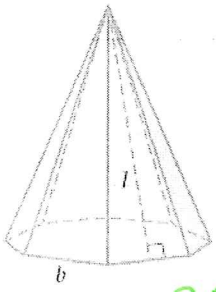
Pyramid

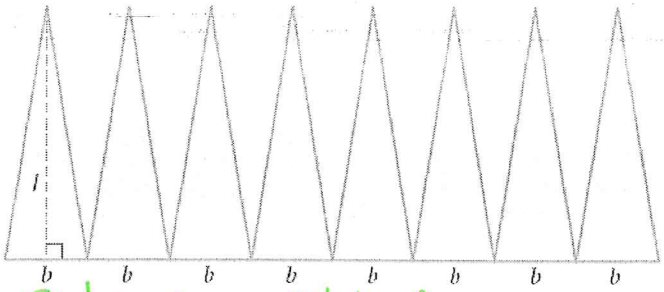


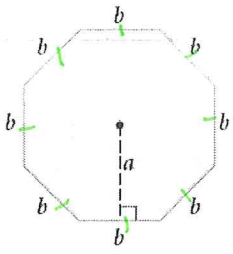
Regular pyramid

A **regular pyramid** has a regular polygon for a base and its height meets the base at its center. The *slant height* of a regular pyramid is the altitude of any lateral face. A nonregular pyramid does not have a slant height.

Write the expression for the lateral area and surface area of the regular pyramid.







$SA = 8 \cdot \frac{1}{2} b \times a + 8 \cdot \frac{1}{2} b \cdot l$

$LA = 8 \cdot \frac{1}{2} b \cdot l$

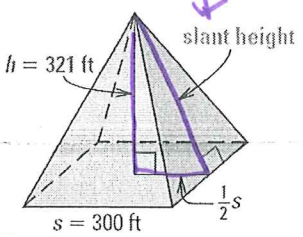
$l = 354.3$

must find

Find the lateral area and surface area of each solid. Round to the nearest tenth if necessary.

Example 1:

REAL LIFE **ARCHITECTURE** The lateral faces of the Pyramid Arena in Memphis, Tennessee, are covered with steel panels. Use the diagram of the arena at the right to find the area of each lateral face of this regular pyramid.

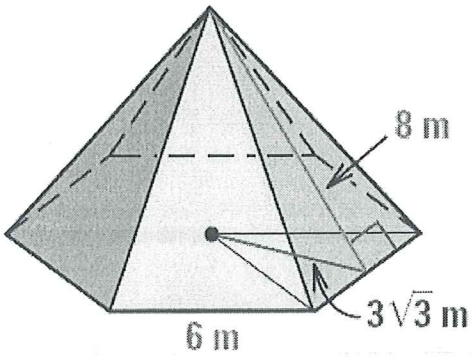


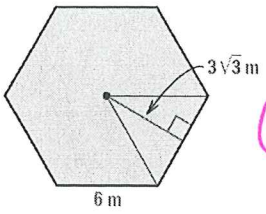
one

One Lateral face $= \frac{1}{2} 300 \times 354.3$

$A = 53145 \text{ ft}^2$

Example 2:





It would be logical to use $\frac{1}{2}aP$. or $6\frac{1}{2}(6\times 3\sqrt{3})$

$SA = 6\frac{1}{2}6\times 3\sqrt{3} = \text{Base}$

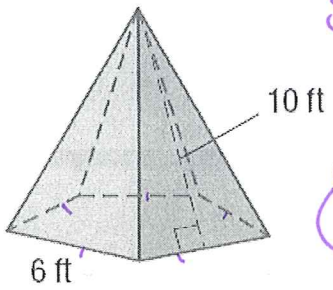
$6(\frac{1}{2}6\times 8)$

$SA \approx 237.5\,m^2$

$SA = 6\frac{1}{2}6\times 8$

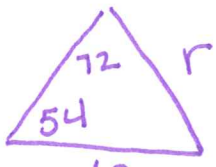
$LA = 144\,m^2$

Example 3: Given: Slant



$SA = 5\frac{1}{2}5.1^2\sin 72 + 5(\frac{1}{2}6\times 10)$

$SA = 211.8\,ft^2$



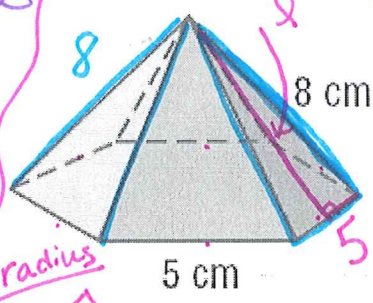
$SA = 5(\frac{1}{2}6\times 10)$

$SA = 150\,ft^2$

$\frac{\sin 72}{6} = \frac{\sin 54}{r}$

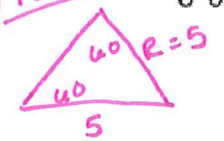
$r \approx 5.1\,ft$

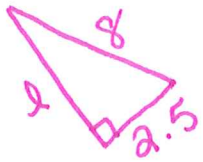
Example 4: Given Edge!



Find slant height

radius





$l = 7.6\,cm$

LA 144

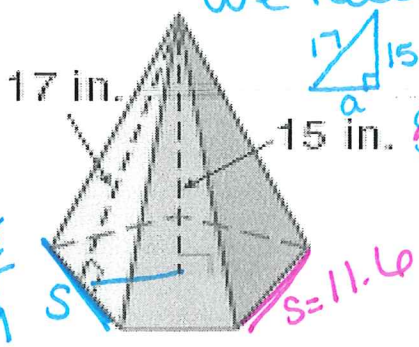
$SA = 6\frac{1}{2}5\times 5\sin 60 + 6\frac{1}{2}5\times 7.6$

$SA = 178.95 = 179.0\,cm^2$

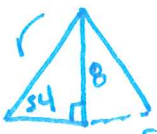
Example 5: height + slant

We need to find apothem

$a = 8\,in$

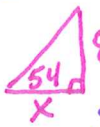


Find Side



$\sin 54 = \frac{8}{r}$

$r = 9.9$



$\tan 54 = \frac{8}{x}$

$x = 5.8\times 2$

$s = 11.6$

LA 493

$SA = 5\frac{1}{2}9.9^2\sin 72 + 5\frac{1}{2}(11.6)(17)$

$SA = 726.0\,in^2$