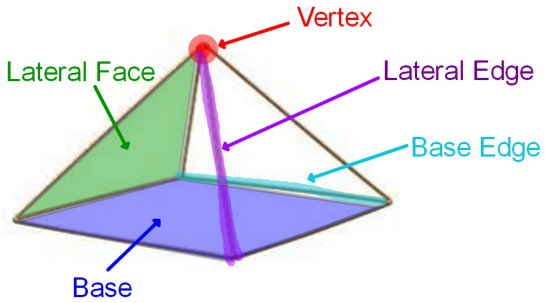
Pyramid

Polyhedron with only one Base that is a polygon and whose Lateral Faces are triangles that meet at the Vertex of the Pyramid.

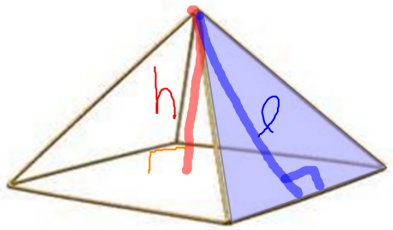


Regular Pyramid:

Base is a Regular Polygon and
Lateral Faces are Isosceles Triangles.

h

Height of the Pyramid (Altitude)
Perpendicular segment from the Vertex to the Base

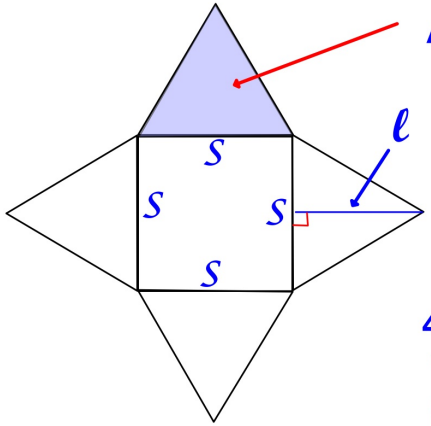


Slant Height

ℓ

Perpendicular segment from the Vertex to the base of the a triangular face.

Lateral Area of a Pyramid:



$A = \frac{1}{2}bh = \frac{1}{2}s\ell$

$LA = 4(\frac{1}{2}s\ell)$

$LA = \frac{1}{2}(4s\ell)$

$4s$ = perimeter of the Base

$LA = \frac{1}{2}(p\ell)$

Lateral Area of a Pyramid:

$$LA = \frac{1}{2}(p\ell)$$

Surface Area of a Pyramid:

$$SA = LA + B$$

Lateral Area — Area of the Base

Surface Area of a Pyramid:

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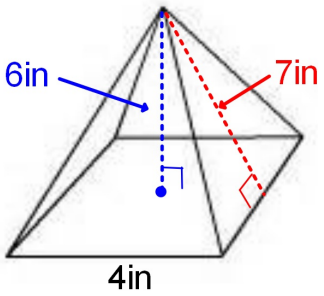
Lateral Area — Area of the Base

$$LA = \frac{1}{2}(p\ell)$$

1. Find the Surface Area of this Square Pyramid.



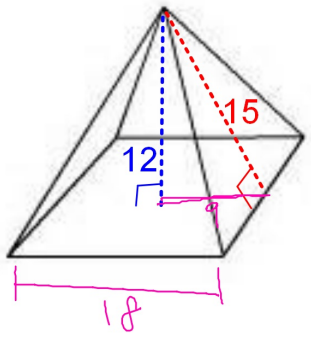
$SA = B + LA$

$4^2 + \frac{1}{2}(16)(7)$

$16 + 56$

$= 72\ in^2$

2. Find the SA of this Square Pyramid.

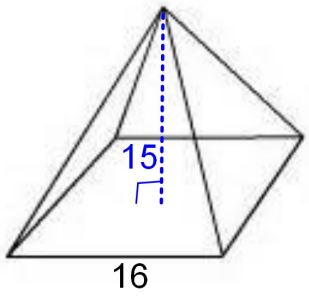


$SA = B + LA$

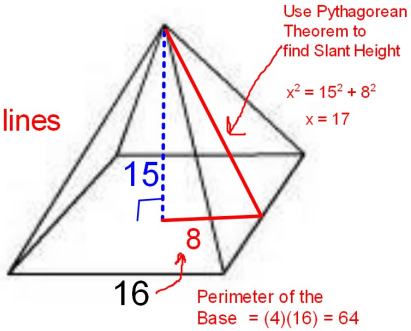
$= 18^2 + \frac{1}{2}(4 \cdot 18)(15)$

SA = 463

3. Find the SA of this Square Pyramid.



Add the lines in red



Use Pythagorean Theorem to find Slant Height

$x^2 = 15^2 + 8^2$

$x = 17$

Perimeter of the Base = (4)(16) = 64

SA = B + LA

$= 16^2 + 0.5(64)17$

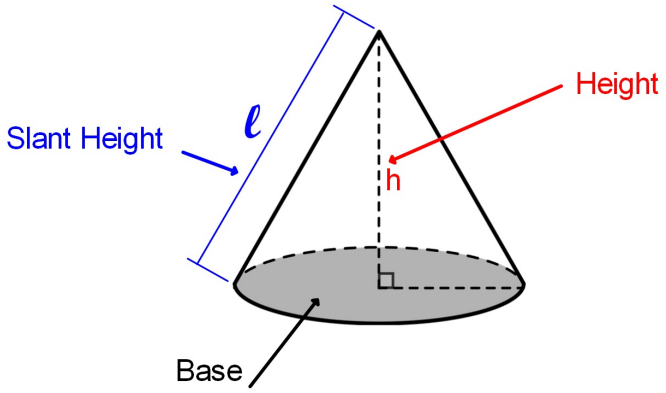
SA = 800

Cone:

Like a Pyramid but the Base is a Circle.
Opposite the Base is the Vertex of the Cone.

Cone:

Like a Pyramid but the Base is a Circle

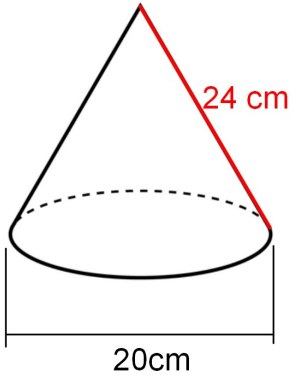


SA of a Cone:

$SA = LA + B$

$\pi r\ell$ $\quad$ πr^2

Find the SA of this cone. Leave your answer in terms of π

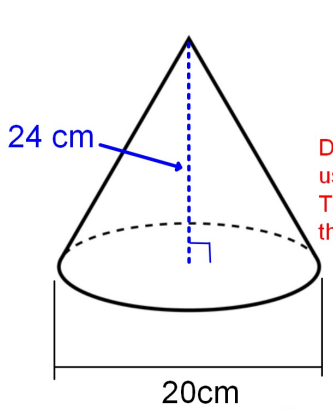


$SA = B + LA$

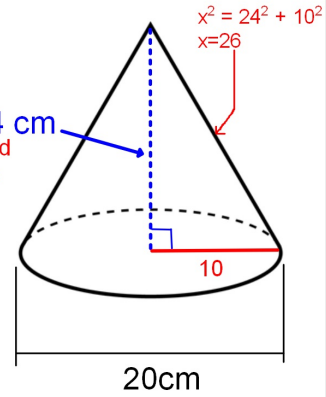
$= \pi(10)^2 + \pi(10)24$

$= 340\pi \text{ cm}^2$

Find the SA of this cone. Leave your answer in terms of π



Draw a radius and use Pythagorean Theorem to find the slant height.



$SA = \pi(10)^2 + \pi(10)(26) = 360\pi \text{ cm}^2$