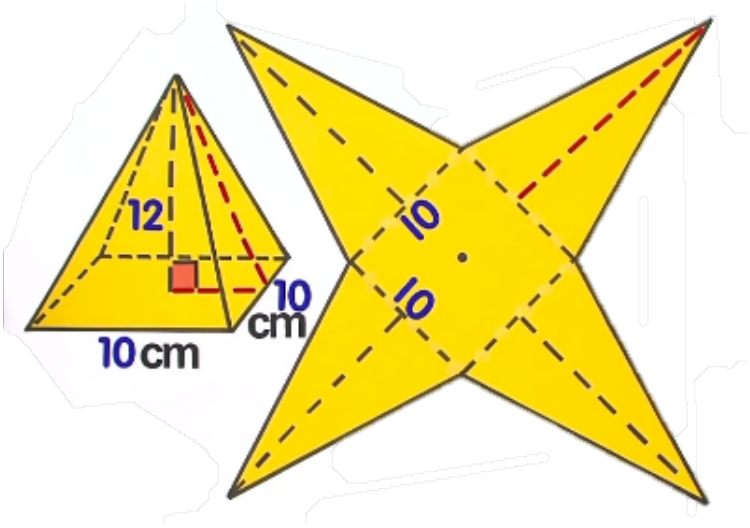
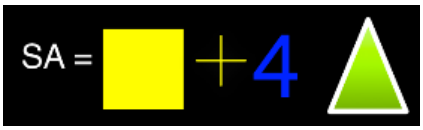
GN 6.2 Surface Area of Pyramids & Cones Name: _____

Opener: Find the surface area of the square pyramid below.



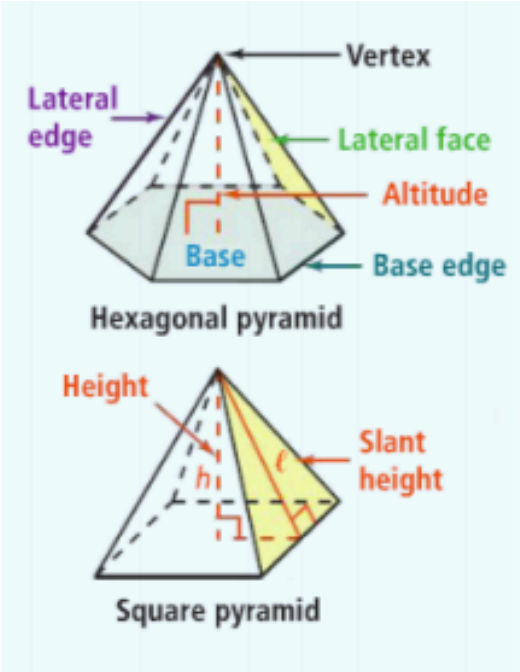


VOCABULARY

Pyramid:

Altitude:

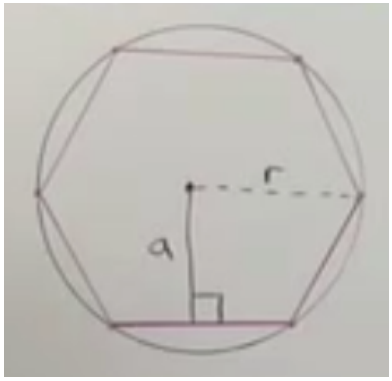
Slant Height:



Regular Pyramid:

Lateral Area of a Regular Pyramid =

Surface Area of a Regular Pyramid =



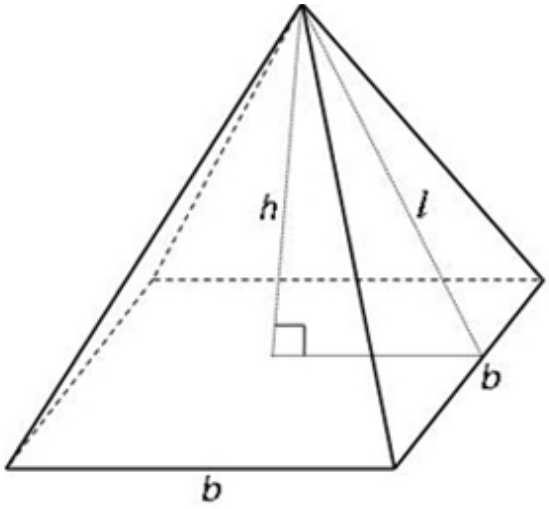
Parts of the Base of a Pyramid

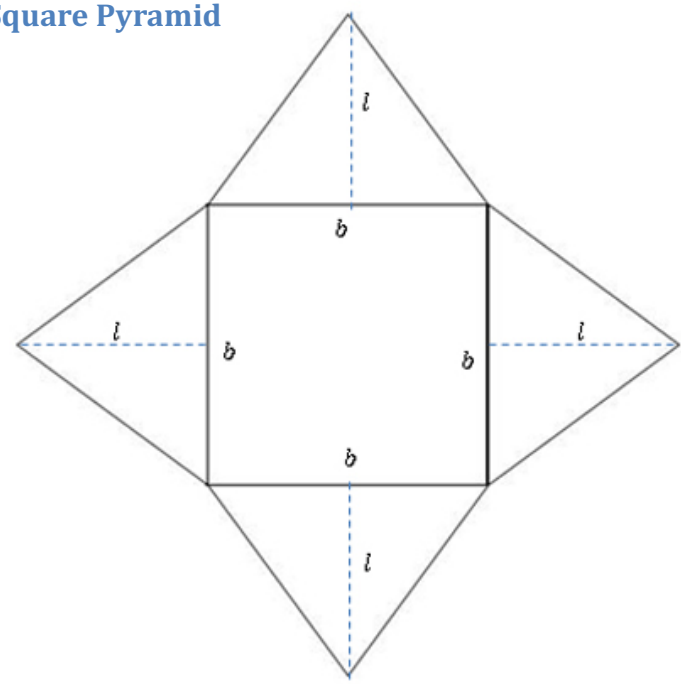
Apothem of regular polygon =

Radius or regular polygon =

Two Different Methods/Formulas for Solving Regular Pyramids

Example: Regular Square Pyramid





Surface Area of Any Pyramid

$$SA_{Pyramid} = A_B + LA$$

$$SA_{Pyramid} = A_B + (\#\ of\ \blacktriangle)(Area\ of\ \blacktriangle)$$

Surface Area of Any Pyramid

$$SA_{Pyramid} = A_B + LA$$

$$SA_{Pyramid} = A_B + \frac{P_B \ell}{2}$$

Why do they both equations work?

$$SA_{Pyramid} = A_B + LA$$

$$SA_{Pyramid} = A_B + (\#\ of\ \blacktriangle)(Area\ of\ \blacktriangle)$$

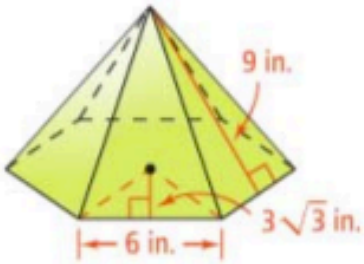
$$SA_{Pyramid} = A_B + (\#\ of\ \blacktriangle)\left(\frac{b\ell}{2}\right)$$

$$SA_{Pyramid} = A_B + (\#\ of\ \blacktriangle)\cdot b\left(\frac{\ell}{2}\right)$$

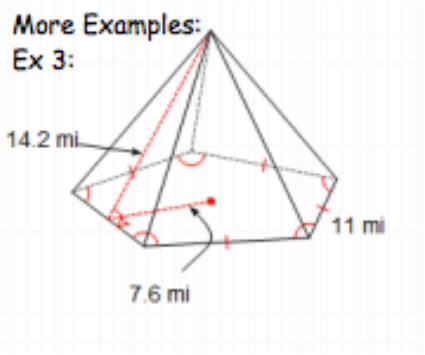
$$(\#\ of\ \blacktriangle)\cdot b = P_B$$

$$SA_{Pyramid} = A_B + \frac{P_B \ell}{2}$$

Ex 1: Find the lateral and surface areas of this regular hexagonal pyramid.



More Examples:
Ex 3:

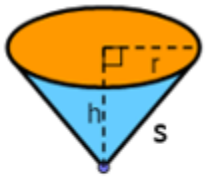


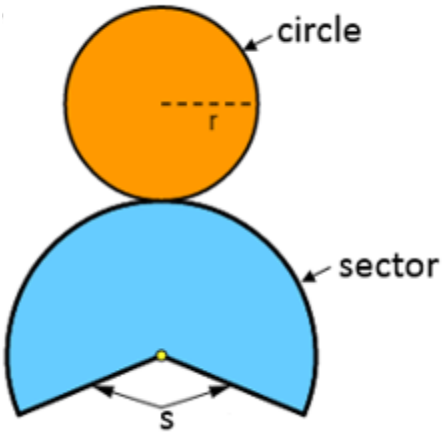
MISSING DIMENSIONS:

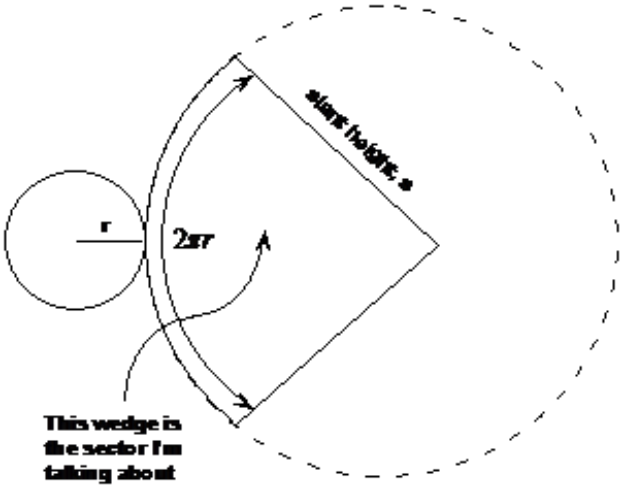
A cone has a radius of 5cm and a surface area of 300cm^2. Determine the slant height of the cone.

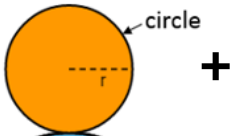
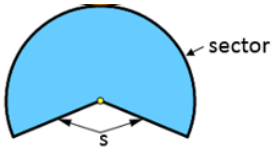
A square pyramid has a slant height of 2 inches and a surface area of 32 in^2. What is the length of one side of the square base?

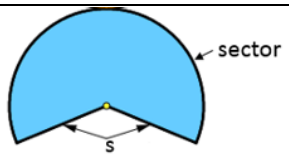
Proof of Surface Area of Any Cone

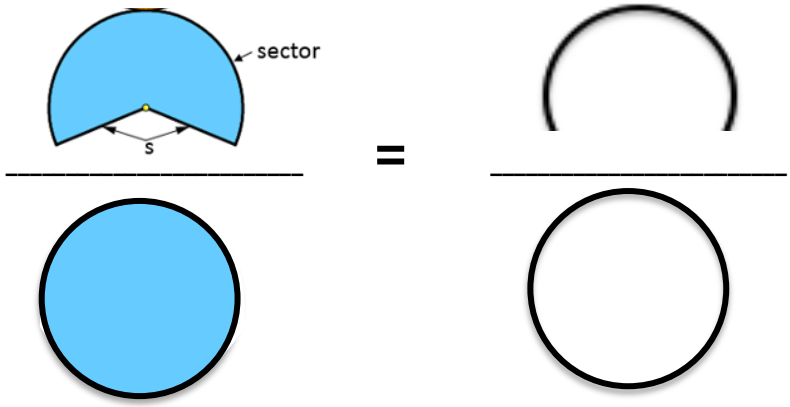




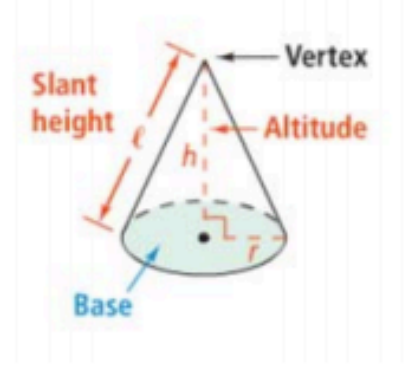


SA =  **+** 

SA = πr^2 **+** 



Cone:

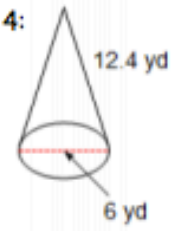


Lateral Area of a Cone =

Surface Area of a Cone =

Ex 2: Find the lateral and surface areas of the following cone:

Ex 4:



A cone has surface area of 72π cm^2 with a slant height of 6 cm. What is the length of the radius of the cone?

Summary:

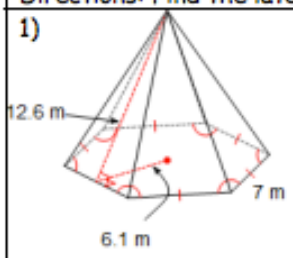
_____

_____

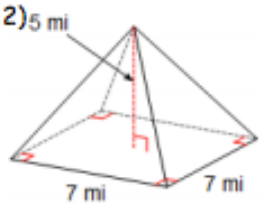
6.2 Practice Problems

Directions: Find the lateral area. Round to the nearest tenth if necessary.

1)

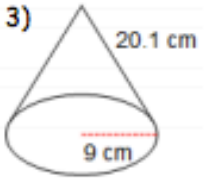


2)

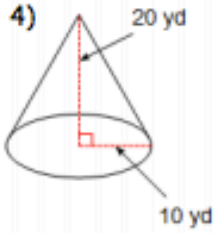


Directions: Find the lateral area. Leave in terms of π and round to the nearest tenth.

3)

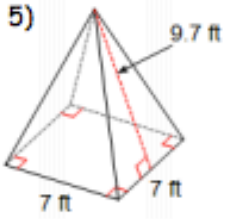


4)

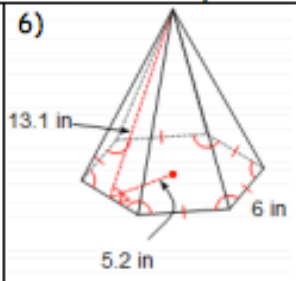


Directions: Find the surface area. Round to the nearest tenth if necessary.

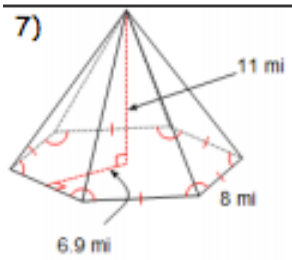
5)



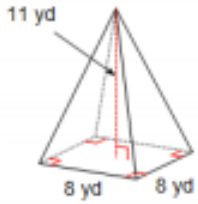
6)



7)

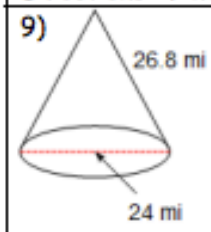


8) 11 yd

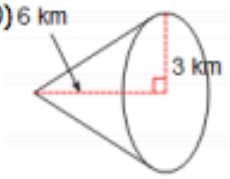


Directions: Find the surface area. Leave in terms of π and round to the nearest tenth.

9)



10) 6 km



Directions: Find the missing length.

11) A square pyramid has a surface area of 84 in^2 with a slant height of 4 in. What is the length of one side of the base?

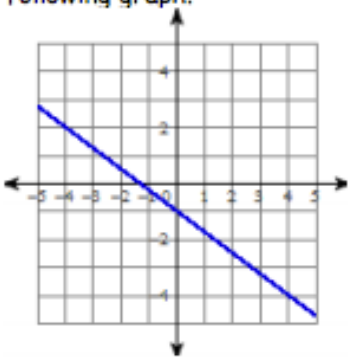
12) A cone has a surface area of 90π in^2 with a slant height of 9 in. What's the length of the radius?

Algebra Review

Solve: $4 - 8n > 6 - 5(5n - 3)$

Solve: $5b + 12 < 4(b + 4)$

Write the equation of the line for the following graph.



Factor Completely:

$12n^2 + 117n + 168$

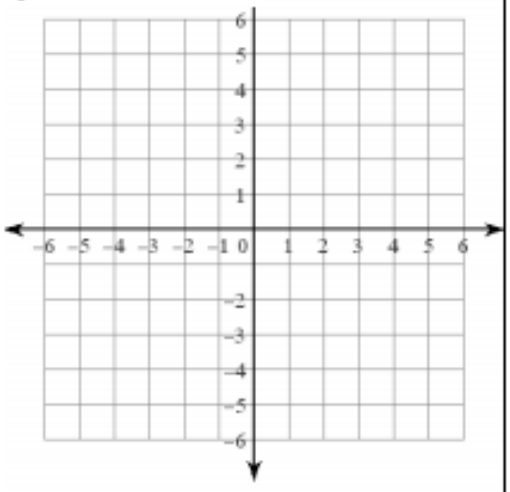
Factor Completely:

$4k^2 - 25$

Solve by graphing:

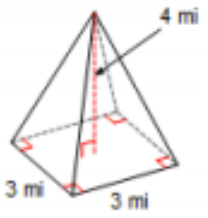
$y = -5x - 3$

$y = -5x + 3$



Directions: Find the surface area to the nearest tenth.

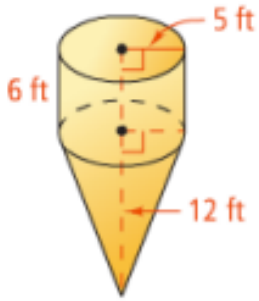
1)



2) A cone has surface area of 65π in^2 and slant height of 8. What is the radius of the cone?

Find the surface area of the following to the nearest whole number.

3) Draw the two shapes that make up the composite figure. Then find the surface area. (HINT: Are you using all sides for each formula?)



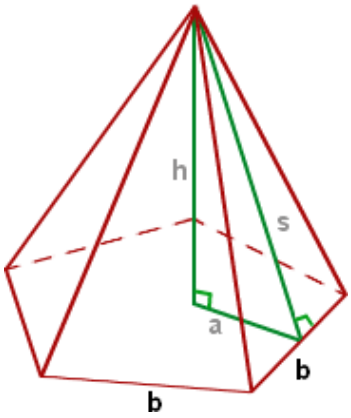
4) Draw the two shapes that make up the composite figure. Then find the surface area. (HINT: Are you using all sides for each formula?)

5) Mr. Brust is growing increasingly concerned that the other Algebros are going to attack his house so he builds a lookout tower that is a cylinder with a cone on top (see picture). His wife is not happy with the grey color and makes Mr. Brust paint the watch tower pink. If the cylindrical part of the watch tower is 20 feet tall, the conical part 30 feet tall and the radius of both 10 feet, what is the square footage that he'll need to paint?

If one bucket of paint will cover 200 square feet, how many buckets will he need to buy?

6. Find the lateral area of the sugar cone.

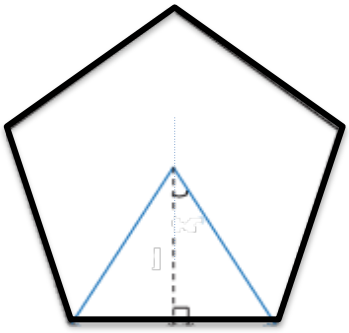
7. A regular pentagonal pyramid has a slant height of 17 yards and a height of 15 yards.



A) Find the lateral area.

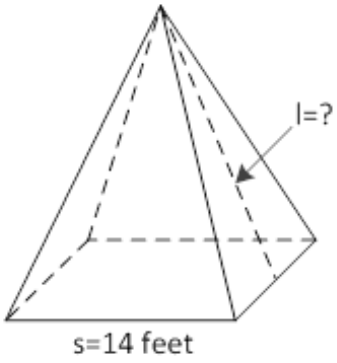
B) Find the apothem.

C) Using the diagram of the base below, find the base area.

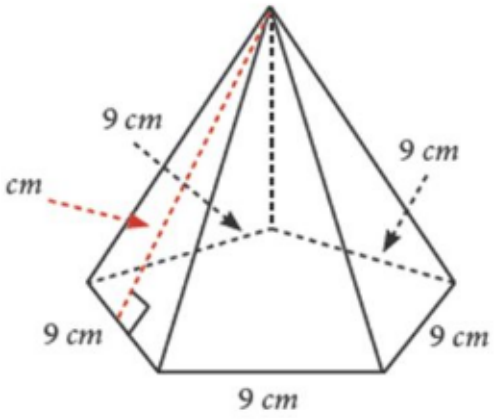


D) Find the total surface area.

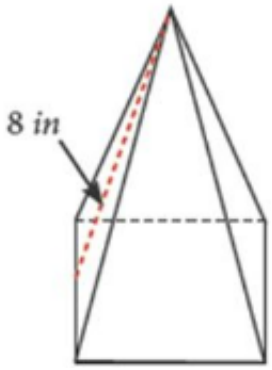
8. The base of the following pyramid is a square. If the surface area of the pyramid is 400 feet^2, what is the missing length? Round the answer to the nearest hundredth.



9. Find the slant height. Given:
The surface area is 409 square centimeters.

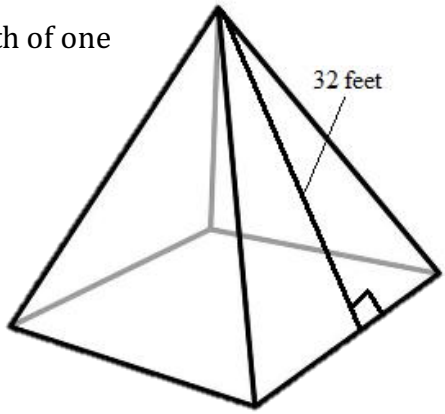


10. If the surface area of the pyramid is 260 in^2, find the length of one side of the square base.



11. The surface area of a cone is 39 π ft^2 and the slant height is 10 ft. Find the radius of the cone.

12. The surface area of the square pyramid is $2225\,ft^2$. Find the length of one side.



13. Find the radius of a cone with a surface area of $14\pi\ cm^2$ and a slant height of 5 cm.