


Homework Solutions

 Worksheet - Surface Area of Prisms and Cylinders.docx

Solutions...

- 1) 88 ft^2 2) 169.6 in^2 3) 96 mm^2 4) 276.5 yd^2
5) 361.4 cm^2 6) 304 m^2 7) 210 mi^2 8) 325.8 km^2
9) 464.0 ft^2 10) 558 m^2 11) 378 cm^2 12) 1164.9 in^2
13) 726 m^2 14) 1043.6 cm^2 15) 1441.1 mm^2 16) 2339.9 in^2

The triangular sides of a pyramid are called **lateral faces**. The altitude or height of each lateral face is called the **slant height**. The surface area of a pyramid is the sum of the areas of the lateral faces, or **lateral area**, plus the area of the base.

EXAMPLE 1 Find the surface area of the square pyramid.

Find the lateral area and the base area.

Area of each lateral face

$$A = \frac{1}{2}bh \quad \text{Area of a triangle}$$

$$A = \frac{1}{2}(4)(5) \quad b = 4, h = 5$$

$$A = 10 \quad \text{Simplify.}$$

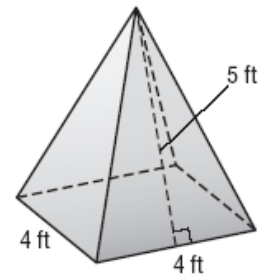
There are 4 faces, so the lateral area is $4(10)$ or 40 square feet.

Area of base

$$A = s^2 \quad \text{Area of a square}$$

$$A = 4^2 \text{ or } 16 \quad s = 4$$

The surface area of the pyramid is the sum of the lateral area and the area of the base, $40 + 16$ or 56 square feet.



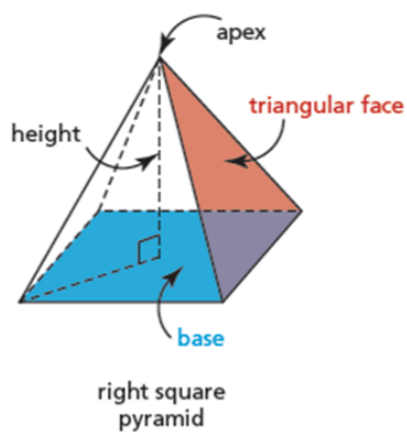


A **right pyramid** is a 3-dimensional object that has triangular faces and a base that is a polygon.

The shape of the base determines the name of the pyramid.

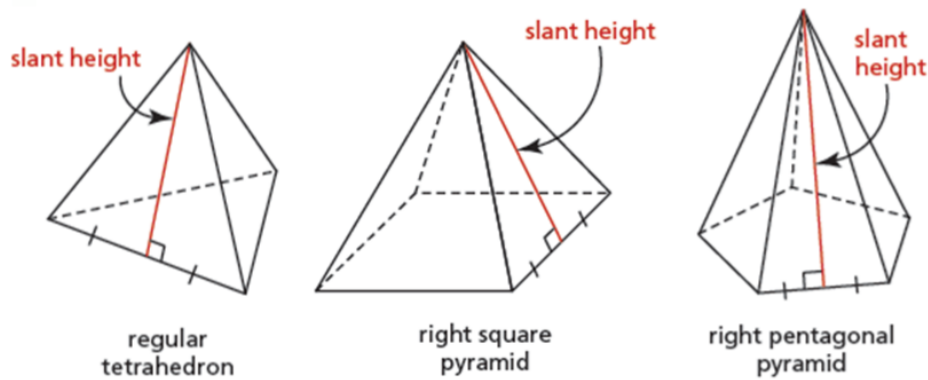
The triangular faces meet at a point called the **apex**.

The *height* of the pyramid is the perpendicular distance from the apex to the centre of the base.



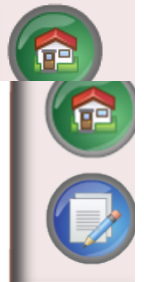
1.4 Surface Areas of Right Pyramids and Right Cones

When the base of a right pyramid is a regular polygon, the triangular faces are congruent. Then the **slant height** of the right pyramid is the height of a triangular face.



The surface area of a right pyramid is the sum of the areas of the triangular faces and the base.

A *tetrahedron* is a triangular pyramid.
A *regular tetrahedron* has 4 congruent equilateral triangular faces.





This right square pyramid has a slant height of 10 cm and a base side length of 8 cm.

This net shows the faces and base of the pyramid.

The area, A , of each triangular face is:

$$A = \frac{1}{2} (8)(10)$$

$$A = 40$$

The area, B , of the base is:

$$B = (8)(8)$$

$$B = 64$$

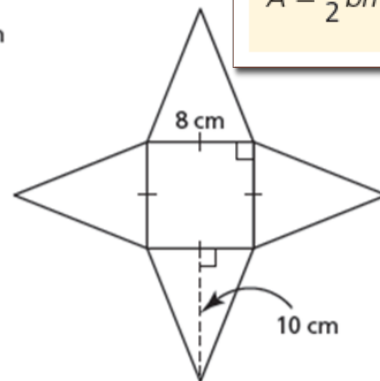
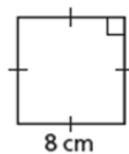
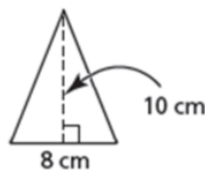
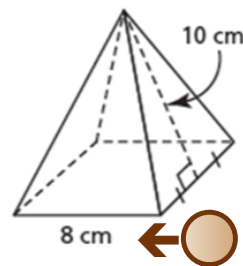
So, the surface area, SA , of the pyramid is:

$$SA = 4A + B$$

$$SA = 4(40) + 64$$

$$SA = 224$$

The surface area of the pyramid is 224 cm^2 .



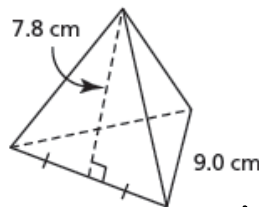
The area, A , of a triangle with base, b , and height, h , is:

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

Example 1

Determining the Surface Area of a Regular Tetrahedron Given Its Slant Height

Jeanne-Marie measured then recorded the lengths of the edges and slant height of this regular tetrahedron. What is its surface area to the nearest square centimetre?



SOLUTION
(Erase to reveal)

$$A = \frac{9 \times 7.8}{2}$$

$$A = 35.1 \text{ cm}^2$$

$$SA = 4 \times 35.1$$

$$SA = 140.4 \text{ cm}^2$$



CHECK YOUR UNDERSTANDING

The surface area of the tetrahedron is approximately 140 cm².

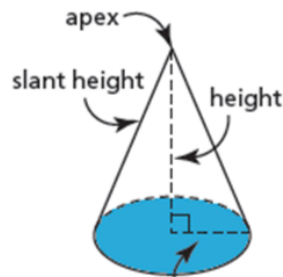
A *right circular cone* is a 3-dimensional object that has a circular base and a curved surface.

The *height* of the cone is the perpendicular distance from the apex to the base.

The *slant height* of the cone is the shortest distance on the curved surface between the apex and a point on the circumference of the base.



A right circular cone is usually called a **right cone**.

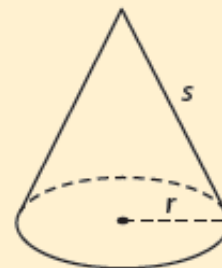


Surface Area of a Right Cone

Surface area = lateral area + base area

For a right cone with slant height s and base radius r :

$$SA = \pi rs + \pi r^2$$



QUIZ TIME...Conversions

*When finished, work on the...

HOMEWORK:

Worksheet - Surface Area of Pyramids and Cones.pdf



Surface Area of a Pyramid

SA = Area Base + Area of Triangular Faces

where Area of a Triangle is

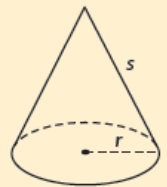
$$A = \frac{1}{2}bh$$

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Attachments

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