Homework Solutions

Worksheet - Surface Area of Prisms and Cylinders.docx

Solutions...

1) 88 ft² 2) 169.6 in² 3) 96 mm²4) 276.5 yd²

5) 361.4 cm² 6) 304 m² 7) 210 mi² 8) 325.8 km²

9) 464.0 ft² 10) 558 m² 11) 378 cm² 12) 1164.9 in²

13) 726 m² 14) 1043.6 cm² 15) 1441.1 mm² 16) 2339.9 in²

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

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

✓ SOLUTION
(Erase to reveal)

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

$A = 10$ Simplify.

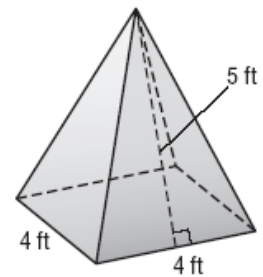There are 4 faces, so the lateral area is 4(10) or 40 square feet.

Area of base

$A = s^2$ Area of a square

$A = 4^2$ or 16 $s = 4$

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.
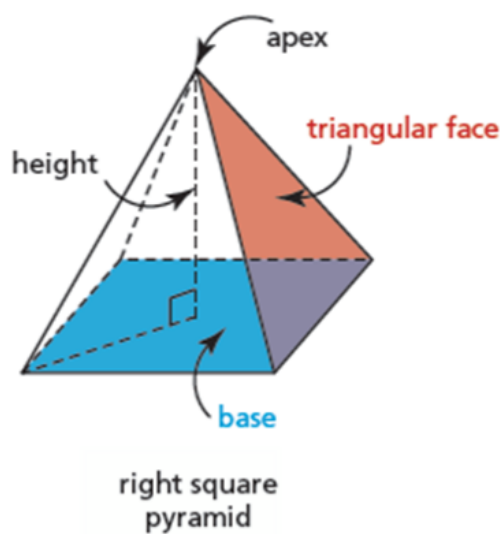
A **right pyramid** is a 3-dimensional object that has triangular faces and a base that is a polygon.
The shape of the base determines the name of the pyramid.
The triangular faces meet at a point called the **apex**.
The *height* of the pyramid is the perpendicular distance from the apex to the centre of the base.


right square
pyramid

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.

regular
tetrahedron

right square
pyramid

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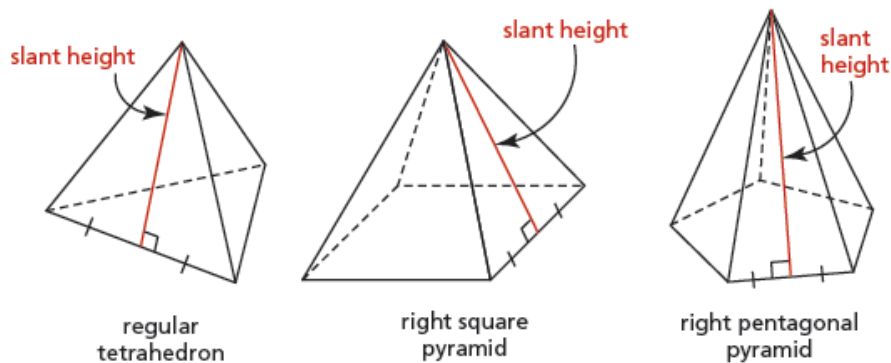
The surface area of a right pyramid is the sum of the areas of the triangular faces and the base.

1.4 Surface Areas of Right Pyramids and Right Cones

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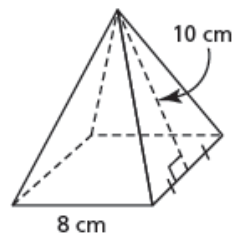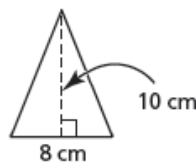
This net shows the faces and base of the pyramid.

The area, A, of each triangular face is:
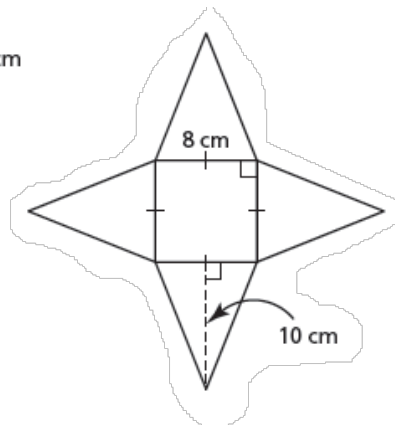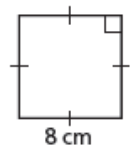
$A = \dfrac{1}{2}(8)(10)$

$A = 40$

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 cm².

1.4 Surface Areas of Right Pyramids and Right Cones

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?

7.8 cm

9.0 cm
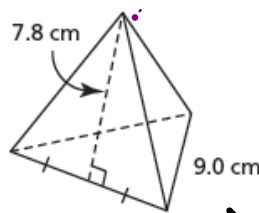
✓ **SOLUTION**
(Erase to reveal)

$$A = \frac{1}{2}(9)(7.8)$$

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

$$SA = 4 \times 35.1$$

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

CHECK YOUR UNDERSTANDING

1.4 Surface Areas of Right Pyramids and Right Cones
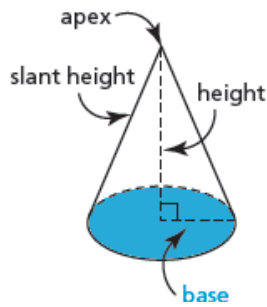
A *right circular cone* is a 3-dimensional object that has a circular base and a curved surface.

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.

ex ➔ $r = 5$ cm
$S = 7$ cm

apex

slant height   height

base

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

$$SA = \pi(5)(7) + \pi(5)^2$$
$$SA = 188.5 \text{ cm}^2$$

Surface Area of a Right Cone

Surface area = lateral area + base area

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

Lateral   Base

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

s

r

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
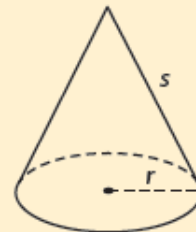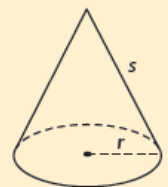
where Area of a Triangle is $A = \frac{1}{2}bh$

Surface Area of a Right Cone

Surface area = lateral area + base area

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

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

Attachments

Worksheet - Surface Area of Prisms and Cylinders.docx

Worksheet - Surface Area of Pyramids and Cones.pdf