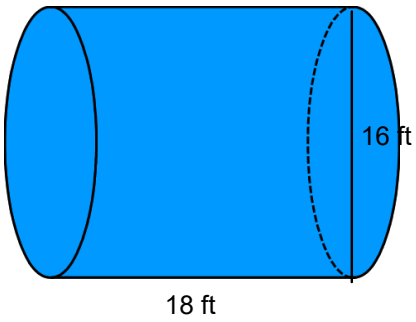
Warm Up Hand In

What is the surface area of the following shape in cm^2?



(Must use formula and show all work)

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

$SA = 2\pi(8)^2 + 2\pi(8)(18)$

$SA = 1306.2\ ft^2$

$1306.2\ ft^2 \times \left[\frac{1\ m}{3.28\ ft}\right]^2$

$= 121.4\ m^2$

Homework...

Basic Area Worksheet

Solutions...

1) $27.04\ in^2 = 174.45\ cm^2$

2) $14\ cm^2 = 2.17\ in^2$

3) $15\ mi^2 = 46\ 464\ 000\ yd^2$

4) $216\ m^2 = 2\ 324.95\ ft^2$

5) $12.56\ m^2 = 15.02\ yd^2$

6) $113.04\ m^2 = 1\ 130\ 400\ cm^2$

7) $314\ m^2 = 3379.8\ ft^2$

8) $12.56\ m^2 = 19\ 468.04\ in^2$

Homework...

Worksheet - Surface Area of Prisms and Cylinders.docx

Solutions...

1) 88 ft^2 = 8.2m^2

2) 169.6 in^2 = 1 094.5 cm^2

3) 96 mm^2 = 0.96 cm^2

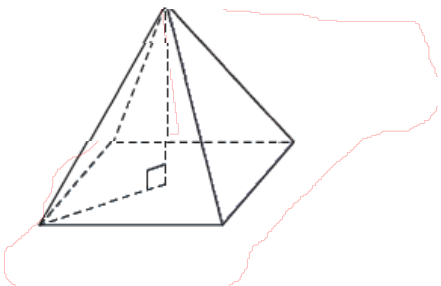
4) 276.5 yd^2 = 2 488.5 ft^2

5) 361.4 cm^2 = 36 140 mm^2

6) 304 m^2 = 3272.2 ft^2

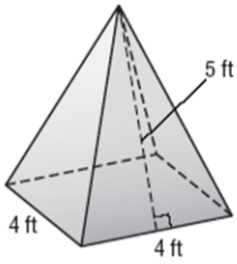
7) 210 mi^2 8) 325.8 km^2
9) 464.0 ft^2 10) 558 m^2 11) 378 cm^2 12) 1164.9 in^2
13) 726 m^2 14) 1043.6 cm^2 15) 1441.1 mm^2 16) 2339.9 in^2

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. ?



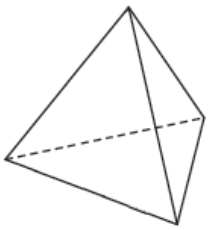
1.4 Surface Areas of Right Pyramids and Right Cones

EXAMPLE 1 **Find the surface area of the square pyramid.**

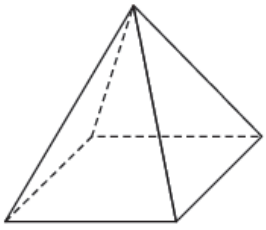


When the base of a right pyramid is a regular polygon, the triangular faces are congruent. Then the **slant height** of the right pyramid is the height of a triangular face.

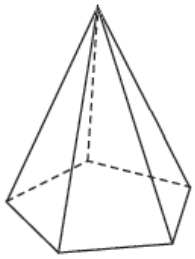
?



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

4.3 - Surface Area

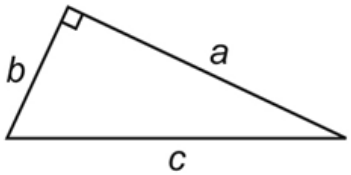
Make Connections

The ancient pyramids at Giza, Egypt, were built about 4500 years ago.

This pyramid has a square base with a side length of 755 feet. The original height of the pyramid was 481 feet. Archeologists believe that the pyramid was once covered with a white limestone casing. How could you calculate the area that was once covered with limestone?

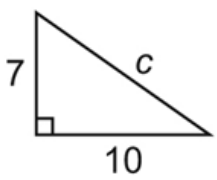
Activate Prior Learning:
The Pythagorean Theorem

In any right triangle, the sum of the squares of the two shorter sides is equal to the square of the longer side.



$a^2 + b^2 = c^2$

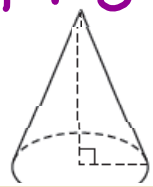
What is the unknown length in this right triangle?



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. ?

$SA_{cone} = \pi rs + \pi r^2$



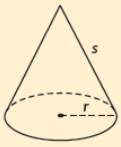
A right circular cone is usually called a **right cone**.

Surface Area of a Right Cone

Surface area = lateral area + base area

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

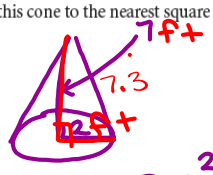
$SA = \pi rs + \pi r^2$



Example 3 Determining the Surface Area of a Right Cone

A right cone has a base radius of 2 ft. and a height of 7 ft.
Calculate the surface area of this cone to the nearest square foot.

SOLUTION
(Erase to reveal)



$SA_{cone} = \pi rs + \pi r^2$

$s \rightarrow a^2 + b^2 = c^2$

$2^2 + 7^2 = c^2$

$4 + 49 = c^2$

$53 = c^2$

$c = 7.3$ ft

CHECK YOUR UNDERSTANDING

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

$= \pi(2)(7.3) + \pi(2)^2$

$= 14.6\pi + 4\pi$

$= 18.6\pi$

$= 58.4 \text{ ft}^2$

$58.4 \text{ ft}^2 \times \left[\frac{1 \text{ m}}{3.2808 \text{ ft}}\right]^2 = 5.4 \text{ m}^2$

Homework...

Worksheet - Surface Area of Pyramids and Cones.pdf

Quiz tomorrow
Squared / cubed conversions
Word problems.

Solutions...

729.9 cm^2 47.8 yd^2 1.88 cm^2 569.7 ft^2

1) 113.1 in^2 2) 40 m^2 3) 188.5 mm^2 4) 63.3 yd^2

7.8 m^2

5) 84 ft^2 6) 263.9 cm^2 7) 208 m^2 8) 301.6 in^2

9) 123.7 ft^2 10) 263.2 mm^2 11) 95.7 cm^2 12) 210 yd^2

13) 74.4 cm^2 14) 152 yd^2 15) 857.7 in^2

Attachments

Worksheet - Surface Area of Prisms and Cylinders.docx

Worksheet - Surface Area of Pyramids and Cones.pdf