Curriculum Outcome

M1 Demonstrate an understanding of the Système International (SI) by describing the relationships of the units for length, area, volume, capacity, mass and temperature.

M2 Demonstrate an understanding of the Imperial system by: describing the relationships of the units for length, area, volume, capacity, mass and temperature.

M3 Solve problems, using SI and Imperial units, that involve linear measurement using estimation and measurement strategies.

Student Friendly: The relationship between area and volume such as

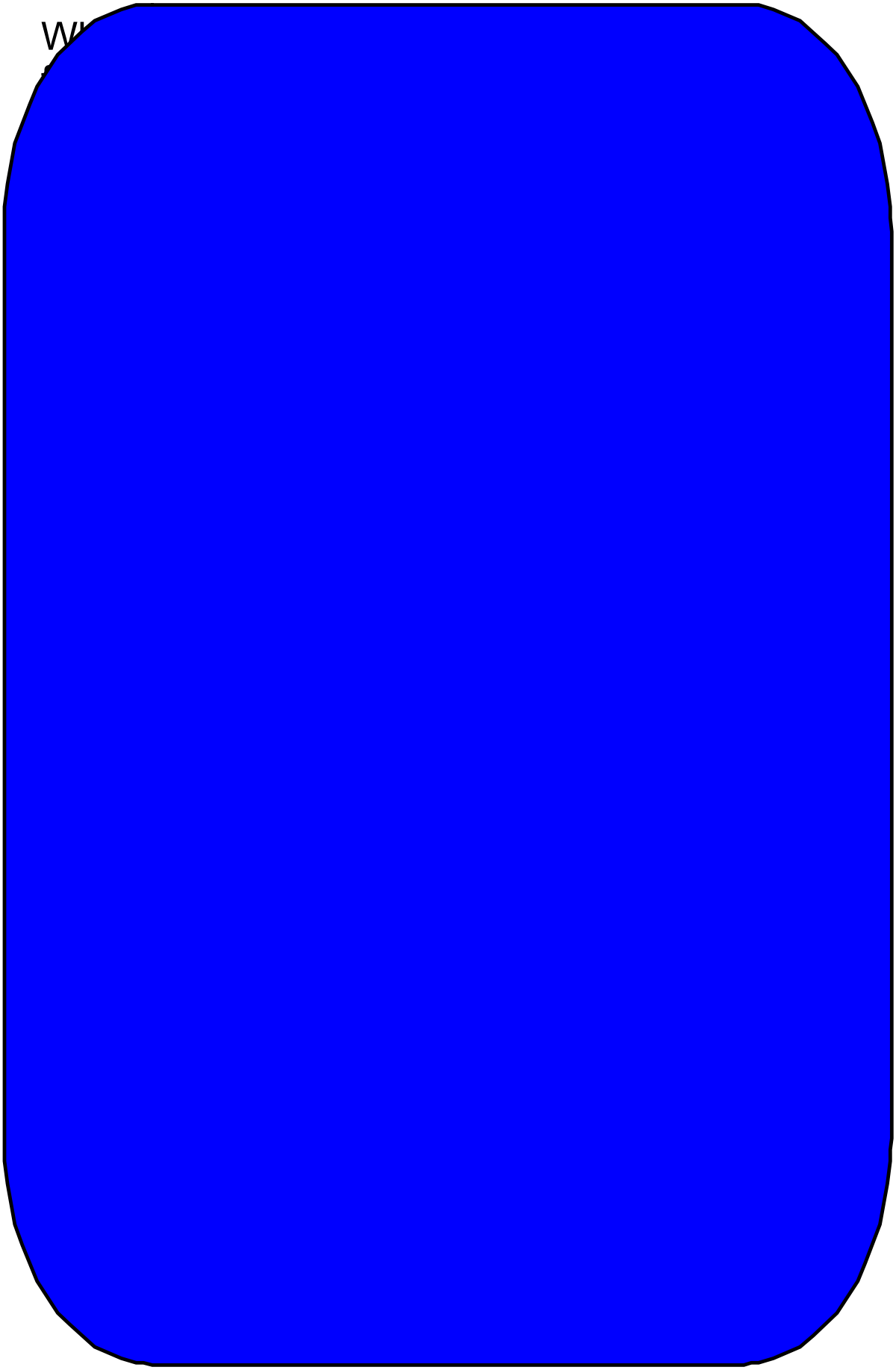
1 m = 1.0936 yd

1 m = 3.2808 ft

1 mi= 1.6093 km

1 in = 2.54 cm

Warm Up Hand In



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

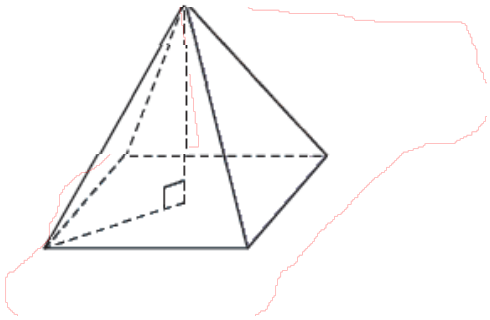
4) 276.5 yd^2 = 2 488.5 ft^2

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

6) 304 m^2 = 3272.2 ft^2

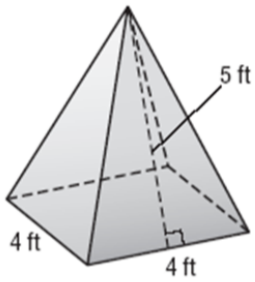
7) 210 mi^2 8) 325.8 km^2
9) 464.0 ft^2 10) 558 m^2 11) 378 cm^2 12) 1164.9 in^2
13) 726 m^2 14) 1043.6 cm^2 15) 1441.1 mm^2 16) 2339.9 in^2 15 096.1cm ^{2}

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. ?

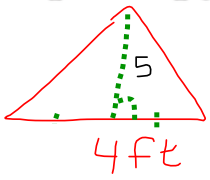


1.4 Surface Areas of Right Pyramids and Right Cones

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



$A = 16\ ft^2$



$A_\Delta = \frac{4 \times 5}{2}$

$A = 10\ ft^2$

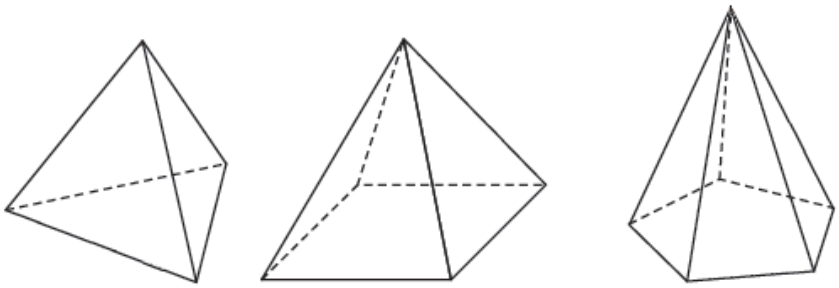
$4A = 40\ ft^2$

$TS_A = 56\ ft^2$

$56\ ft^2 \times \left[\frac{1\ yd}{3\ ft}\right]^2 = 6.2\ yd^2$

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

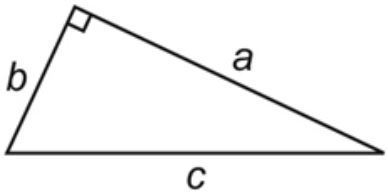
Make Connections

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?

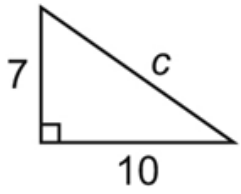
Activate Prior Learning:
The Pythagorean Theorem

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



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

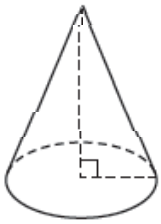
What is the unknown length in this right triangle?



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. ?

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



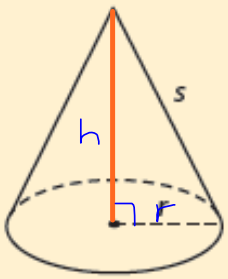
1.4 Surface Areas of Right Pyramids and Right Cones

Surface Area of a Right Cone

Surface area = lateral area + base area

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

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

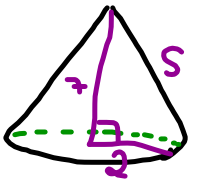


$SA = \pi r s + \pi r^2$

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)



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

$7^2 + 2^2$

$49 + 4$

$\sqrt{53} = \sqrt{c^2}$

$7.3 \text{ ft} = c$

CHECK YOUR UNDERSTANDING

1.4 Surface Areas of Right Pyramids and Right Cones

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

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

$SA = 12.6 \text{ ft} + 45.5 \text{ ft}$

$SA = 58.4 \text{ ft}^2$

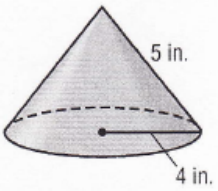
NAME _____ DATE _____ PERIOD ____

7-8 Practice: Skills

Surface Area of Pyramids and Cones

Find the surface area of each solid. Round to the nearest tenth if necessary.

1.



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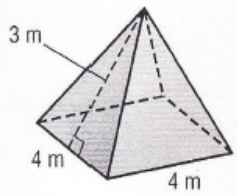

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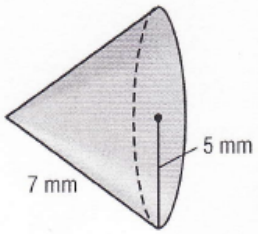

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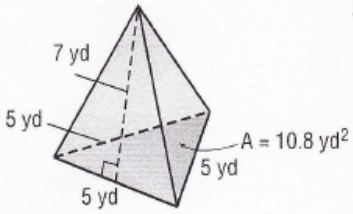

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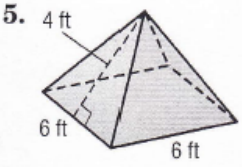

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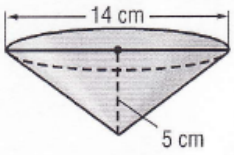

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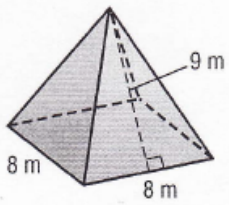

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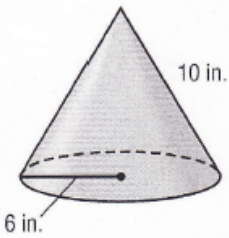

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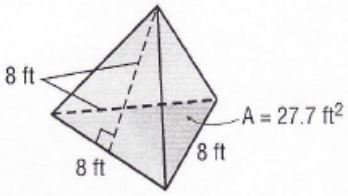

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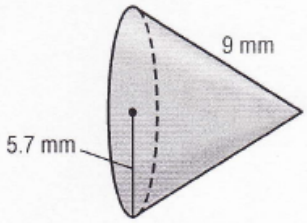

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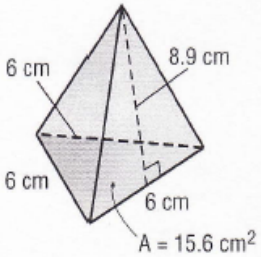

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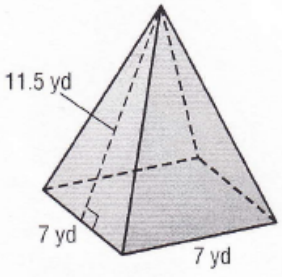

13. square pyramid: base side length, 4 cm; slant height, 7.3 cm

14. square pyramid: base side length, 5 yd; slant height, 12.7 yd

15. cone: diameter, 26 in.; slant height, 8 in.

Homework...

Worksheet - Surface Area of Pyramids and Cones.pdf

Solutions...

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