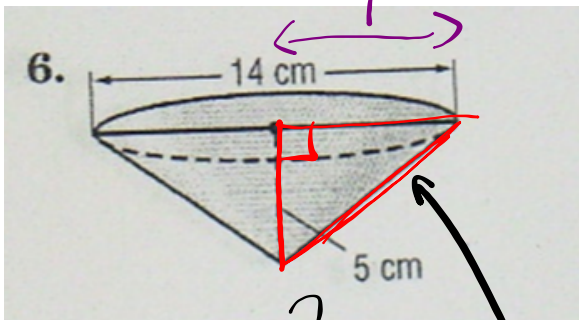


Homework ???

Worksheet - Surface Area of Pyramids and Cones.pdf

Solutions...

- 1) 113.1 in² 2) 40 m² 3) 188.5 mm² 4) 63.3 yd²
 5) 84 ft² 6) ~~263.9 cm²~~ 7) 208 m² 8) 301.6 in²
 9) 123.7 ft² 10) 263.2 mm² 11) 95.7 cm² 12) 210 yd²
 13) 74.4 cm² 14) 152 yd² 15) 857.7 in²



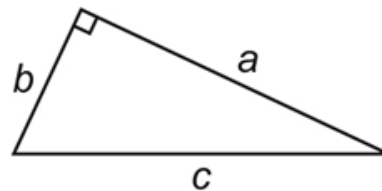
$$\begin{aligned}
 SA_{\text{cone}} &= \pi r^2 + \pi r s \\
 &= \pi(7)^2 + \pi(7)(8.6) \\
 &= 343.1 \text{ m}^2
 \end{aligned}$$

$$\begin{aligned}
 x^2 &= 5^2 + 7^2 \\
 x^2 &= 25 + 49 \\
 \sqrt{x^2} &= \sqrt{74} \\
 x &= 8.6
 \end{aligned}$$



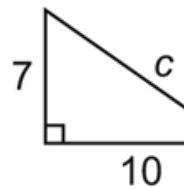
Activate Prior Learning: The Pythagorean Theorem

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?



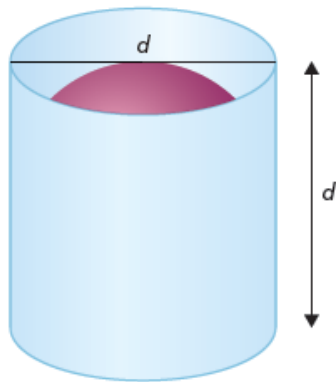
$c^2 = 7^2 + 10^2$
 $c^2 = 49 + 100$
 $c^2 = 149$

1.4 Surface Areas of Right Pyramids and Right Cones

$c = 12.2$

What about a sphere???

The surface area of a sphere is related to the curved surface area of a cylinder that encloses it. The cylinder has the same diameter as the sphere, and a height equal to its diameter. ?



$SA_{cylinder} = 2\pi r^2 + 2\pi rh$
 $SA_{sphere} = 2\pi r h$
 $= 2\pi r d$
 $= 2\pi r (2r)$
 $SA_{sphere} = 4\pi r^2$

1.6 Surface Area and Volume of a Sphere

The curved surface area, SA_C , of a cylinder with base radius r and height h is:

$$SA_C = 2\pi rh$$

When a cylinder has base radius r and height $2r$:

$$SA_C = 2\pi r(2r)$$

$$SA_C = 4\pi r^2$$

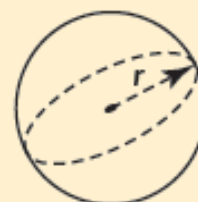


So, this is also the formula for the surface area of a sphere with radius r .

Surface Area of a Sphere

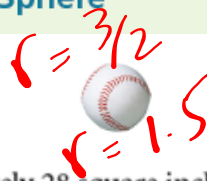
The surface area, SA , of a sphere with radius r is:


$$SA = 4\pi r^2$$



Example 1 Determining the Surface Area of a Sphere

The diameter of a baseball is approximately 3 in.
 Determine the surface area of a baseball to the nearest square inch.



 **SOLUTION** The surface area of a baseball is approximately 28 square inches.
 (Erase to reveal)

$$\begin{aligned}
 SA_{\text{sphere}} &= 4\pi r^2 \\
 &= 4\pi(1.5)^2 \\
 &= 28.3 \text{ in}^2
 \end{aligned}$$



Example 2 Determining the Diameter of a Sphere

The surface area of a lacrosse ball is approximately 20 square inches.
 What is the diameter of the lacrosse ball to the nearest tenth of an inch?

✓ **SOLUTION**
 (Erase to reveal)

Rearranging
 SAMDEB
 ① ② ③

$$SA_{\text{sphere}} = 4\pi r^2$$

$$\frac{20}{4\pi} = \frac{4\pi r^2}{4\pi}$$

$$\sqrt{1.59} = r^2$$

$$1.26 = \text{radius}$$

Diameter = 1.26×2
 = 2.5 in.

1.6 Surface Area and Volume of a Sphere

The diameter of the lacrosse ball is approximately $2\frac{5}{10}$ in., or $2\frac{1}{2}$ in.

CHECK YOUR UNDERSTANDING

2. The surface area of a soccer ball is approximately 250 square inches. What is the diameter of a soccer ball to the nearest tenth of an inch?

$$SA = 4\pi r^2$$

$$\frac{250}{4\pi} = \frac{4\pi r^2}{4\pi}$$

$$\sqrt{19.89} = \sqrt{r^2}$$

$$4.5 = r$$

$$d = 2r$$

$$= 2(4.5)$$

$$= 9 \text{ in}$$



Determining the Surface Area of a Composite Object

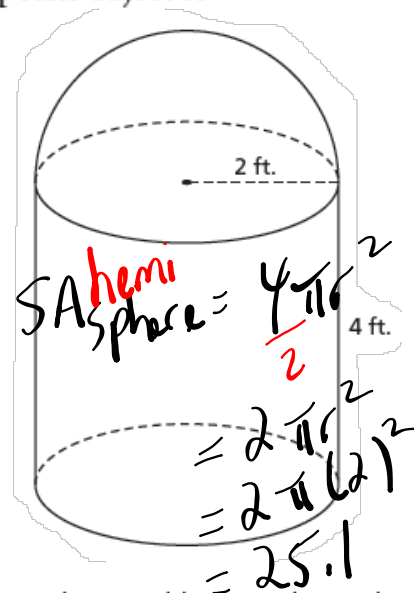


To calculate the surface area of a composite object, the first step is to determine the faces that comprise the surface area. Then calculate the sum of the areas of these faces.

EXAMPLE #1: Determine the surface area of this composite object to the nearest square foot.

SOLUTION
(Erase to reveal)

$$\begin{aligned}
 SA_{\text{cylinder}} &= 1\pi r^2 + 2\pi rh \\
 &= \pi(2)^2 + 2\pi(2)(4) \\
 &= 62.8
 \end{aligned}$$



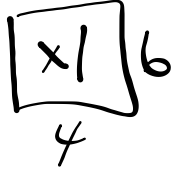
$$\begin{aligned}
 SA_{\text{total}} &= 62.8 \\
 &+ 25.1 \\
 &= 87.9 \text{ ft}^2
 \end{aligned}$$

1.7 Solving Problems Involving Objects

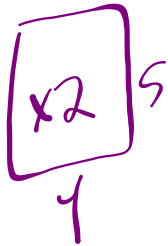
The surface area of the composite object is approximately 88 square feet.

TRY THIS ONE...

Rectangular Prism



$$A = 4(6) = 24$$

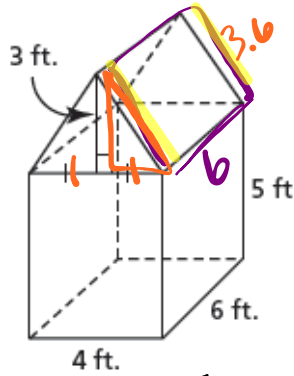


$$A = 4(5) = 20$$



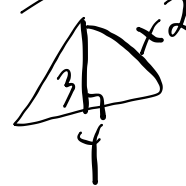
$$A = 6(5) = 30$$

$$SA_{R, Prism} = \begin{matrix} 24 \\ + 20(2) \\ + 30(2) \\ \hline 124 \text{ ft}^2 \end{matrix}$$



$$\begin{aligned} x^2 &= 3^2 + 2^2 \\ x^2 &= 9 + 4 \\ x^2 &= 13 \\ x &= \sqrt{13} \\ x &= 3.6 \end{aligned}$$

Triangular Prism



$$A = \frac{4(3)}{2} = 6$$




$$A = 6(3.6) = 21.6$$

$$SA_{T, Prism} = \begin{matrix} 6(2) \\ + 21.6(2) \\ \hline 55.3 \text{ ft}^2 \end{matrix}$$

$$SA_{total} = \begin{matrix} 124 \\ + 55.3 \\ \hline 179.3 \text{ ft}^2 \end{matrix}$$

1.7 Solving Problems Involving Objects

HOMework...

 Worksheet - Surface Area of 3D Objects.pdf

Attachments

Worksheet - Surface Area of Pyramids and Cones.pdf

Worksheet - Surface Area of 3D Objects.pdf