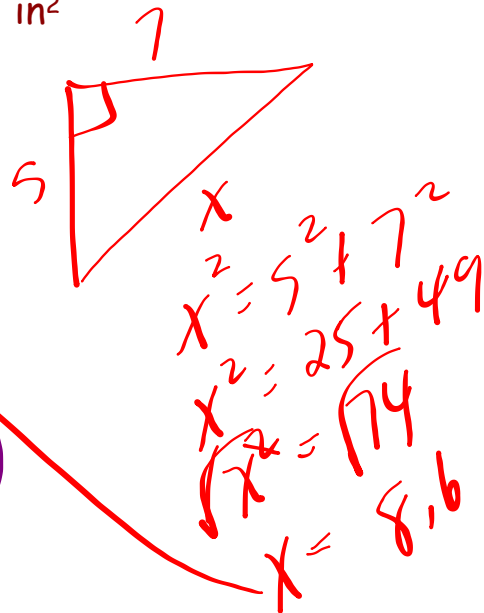
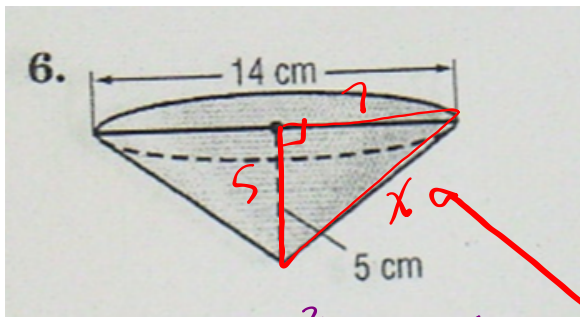


Homework... ????

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



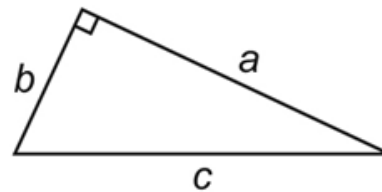
$$SA = \pi r^2 + \pi r s$$

$$SA = \pi (7)^2 + \pi (7)(\sqrt{74})$$

$$SA = 343.1 \text{ cm}^2$$

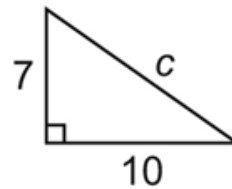
Activate Prior Learning: The Pythagorean Theorem

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?



$$c^2 = 7^2 + 10^2$$

$$c^2 = 49 + 100$$

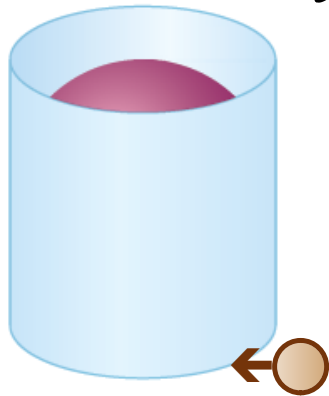
$$c^2 = \sqrt{149}$$

$$c = 12.2$$

1.4 Surface Areas of Right Pyramids and Right Cones

What about a sphere???

The surface area of a sphere is related to the curved surface area of a cylinder that encloses it. ?



Handwritten notes in purple, red, and green ink:

$$2\pi r h$$

$$\pi d d$$

$$d^2 \pi$$

$$(2r)^2 \pi$$

$$4r^2 \pi$$

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

If the curved surface of the cylinder is made from paper, it can be cut and pasted on the surface of the sphere to cover it.

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 $2r$:

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

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



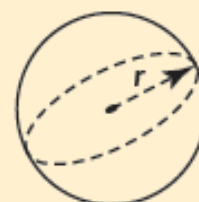
So, this is also the formula for the surface area

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)

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



1.6 Surface Area and Volume of a Sphere

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

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

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

$$\sqrt{\left(\frac{20}{4\pi}\right)} = \sqrt{r^2}$$

$$= r$$

$r = \sqrt{(20/4/\pi)}$
 1.261566261
 Ans*2
 2.523132522

$d =$

Surface Area and Volume of a Sphere

$d = 2.5 \text{ in}$

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?

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

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

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

$$\sqrt{\frac{250}{4\pi}} = r$$

$$\leftarrow d$$

```

√(250/4/π)
4.46031029
Ans*2
8.920620581
    
```



[Answer: approximately $8\frac{9}{10}$ in.]

$d = 8.9 \text{ in.}$

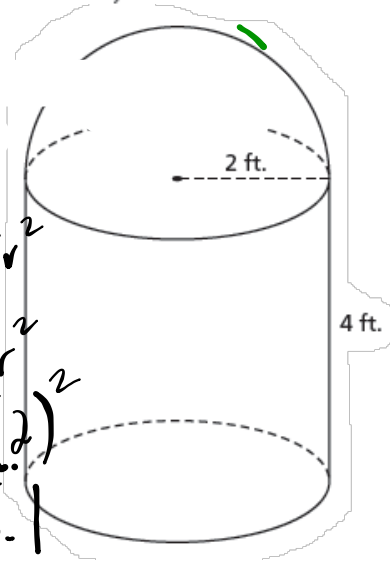


Determining the Surface Area of a Composite Object

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)



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

$$\begin{aligned}
 SA_{\text{hemisphere}} &= \frac{4}{2}\pi r^2 \\
 &= 2\pi r^2 \\
 &= 2\pi(2)^2 \\
 &= 25.1
 \end{aligned}$$

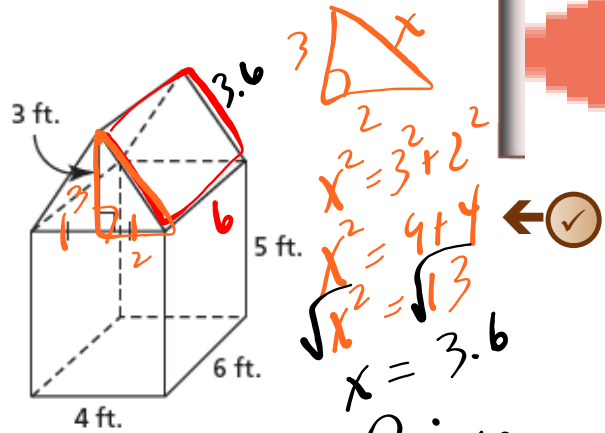
1.7 Solving Problems Involving Objects

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

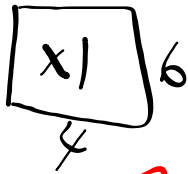
The surface area of the composite object is approximately 88 square feet.

TRY THIS ONE...

A tool shed is formed by a rectangular prism with a triangular prism as its roof. Determine the surface area of the tool shed to the nearest square foot.

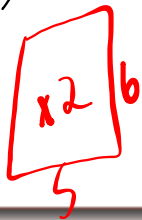


Rectangular Prism



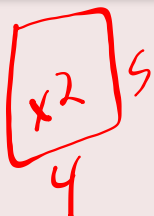
$$A = 4(6)$$

$$A = 24$$



$$A = 5(6)$$

$$A = 30$$



$$A = 4(5)$$

$$A = 20$$

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

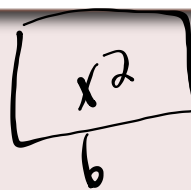
Triangular Prism...



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

$$A = 6$$

1.7 Solving Problems Involving Objects



$$A = 6(3.6)$$


$$A = 21.6$$

$$SA_{\text{Tri Prism}} = \begin{matrix} 21.6(2) \\ + 6(2) \\ \hline 55.3 \end{matrix}$$

$$SA_{\text{Total}} = \begin{matrix} 124 \\ + 55.3 \end{matrix}$$

$$\boxed{179.3 \text{ ft}^2}$$

HOMework...

 Worksheet - Surface Area of 3D Objects.pdf

Attachments

Worksheet - Surface Area of Pyramids and Cones.pdf

Worksheet - Surface Area of 3D Objects.pdf