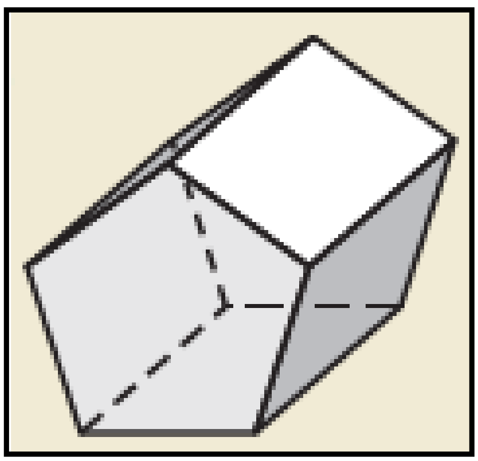
Bellwork
05/07/12

Find the number of faces, edges, and vertices.

1. 

F = 7

V = 10

E = 15

7 + 10 = 15 + 2

17 = 17 ✓

Geometry
12.2 Surface Area of Prisms and Cylinders
Standard(s): 4

Vocabulary:

Prism: A polyhedron with two congruent faces (called bases) that lie in parallel planes.

Lateral Faces: Parallelograms formed by connecting the vertices of the bases.

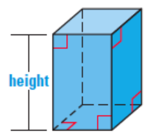
Lateral Edges: Segments connecting the vertices of the bases.

Surface Area: The sum of the areas of its faces.

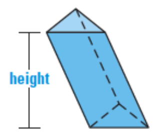
Lateral Area: The sum of the areas of the lateral faces.

Right Prism: Each lateral edge is perpendicular to both bases.

Oblique Prism: A prism with lateral edges that are not perpendicular to the bases.



Right rectangular prism



Oblique triangular prism

Cylinder: A solid with congruent circular bases that lie in parallel planes.

Right Cylinder: The segment joining the centers of the bases is perpendicular to the bases.

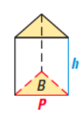
THEOREM *For Your Notebook*

THEOREM 12.2 Surface Area of a Right Prism

The surface area S of a right prism is the sum of the base areas and lateral area:

$S = 2B + Ph$,

where B is the area of the base, P is the perimeter of a base, and h is the height.



$S = 2B + Ph$

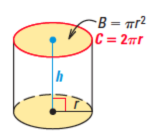
THEOREM *For Your Notebook*

THEOREM 12.3 Surface Area of a Right Cylinder

The surface area S of a right cylinder is the sum of the base areas and the lateral area:

$S = 2B + Ch = 2\pi r^2 + 2\pi rh$,

where B is the area of a base, C is the circumference of a base, r is the radius of a base, and h is the height.



$S = 2B + Ch = 2\pi r^2 + 2\pi rh$

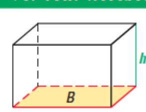
THEOREMS *For Your Notebook*

THEOREM 12.6 Volume of a Prism

The volume V of a prism is

$V = Bh$,

where B is the area of a base and h is the height.



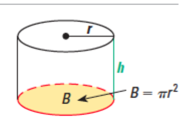
$V = Bh$

THEOREM 12.7 Volume of a Cylinder

The volume V of a cylinder is

$V = Bh = \pi r^2 h$,

where B is the area of a base, h is the height, and r is the radius of a base.



$V = Bh = \pi r^2 h$

THEOREM *For Your Notebook*

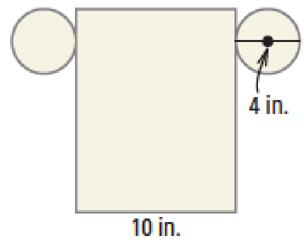
THEOREM 12.8 Cavalieri's Principle

If two solids have the same height and the same cross-sectional area at every level, then they have the same volume.

Surface Area Using Net

Find the surface area of the solid formed by the net. Round the answer to the nearest hundredth.

$r = 2$



$SA = 2B + Ch$

$= 2(2^2\pi) + (2\cdot 2\cdot \pi)(10)$

$= 2(4\pi) + (4\pi)(10)$

$= 8\pi + 40\pi$

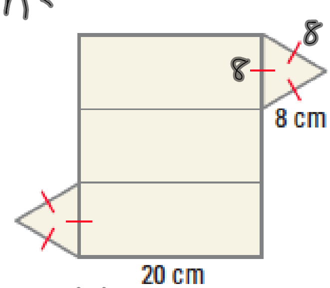
$= 48\pi$

$SA = 150.8\ in^2$

$B =$

$C =$

$h =$



$SA = 2B + Ph$

$B = 16\sqrt{3}$

$P = 24$

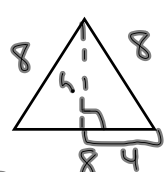
$h = 20$

$SA = 2(16\sqrt{3}) + 24(20)$

$= 32\sqrt{3} + 480$

$= 535.43\ cm^2$

$A_\Delta = \frac{1}{2}bh$



$8^2 = 4^2 + h^2$

$64 = 16 + h^2$

$h = 4\sqrt{3}$

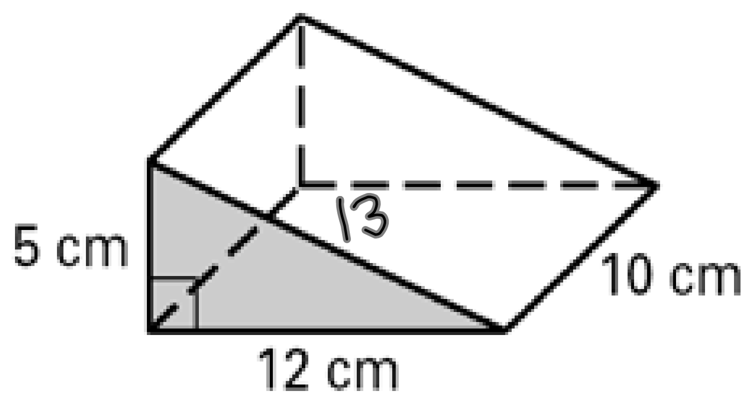
$A_\Delta = \frac{1}{2}(8)(4\sqrt{3})$

$= 4\cdot 4\sqrt{3}$

$= 16\sqrt{3}$

Surface Area of a Right Prism

Find the surface area of the right prism. Round your answer to the nearest hundredth.



$SA = 2B + Ph$

$B = 30\,cm$

$P = 5 + 12 + 13 = 30\,cm$

$h = 10\,cm$

$A_{\Delta} = \frac{1}{2} b h$

$= \frac{1}{2}(12)(5)$

$= 30$

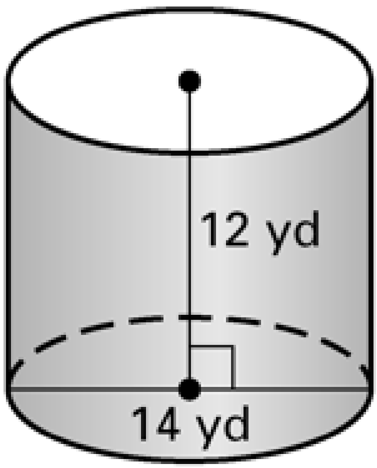
$SA = 2(30) + 30(10)$

$= 60 + 300$

$SA = 360\,cm^2$

Surface Area of a Right Cylinder

Find the surface area of the right cylinder. Round your answer to the nearest hundredth.



$SA = 2B + Ch$

$B = 49\pi \text{ yd}^2$

$C = 14\pi \text{ yd}$

$h = 12 \text{ yd}$

$r = 7$

$A_o = 7^2\pi$

$= 49\pi$

$SA = 2(49\pi) + 14\pi(12)$

$= 98\pi + 168\pi$

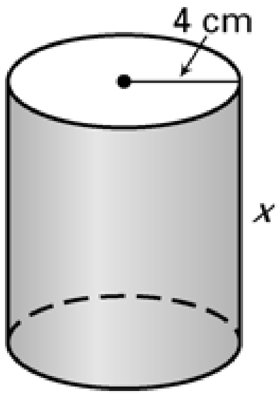
$= 266\pi$

$= 835.66 \text{ yd}^2$

Solve for a Missing Value

Solve for *x* given the surface area. Round your answer to the nearest hundredth.

S=326.73 cm^2



$SA = 2B + Ch$

$B = 16\pi \text{ cm}^2$

$C = 8\pi \text{ cm}$

$h = x$

$326.73 = 2(16\pi) + 8\pi x$

$326.73 = 32\pi + 8\pi x$

$\frac{326.73}{8\pi} = \frac{8\cancel{\pi}(4+x)}{8\cancel{\pi}}$

$13 = 4 + x$

$-4 \quad -4$

$\boxed{x = 9 \text{ cm}}$

Homework Assignment

Worksheet 12.2B