

12.1,12.2

Thursday, April 13, 2017 9:28 AM

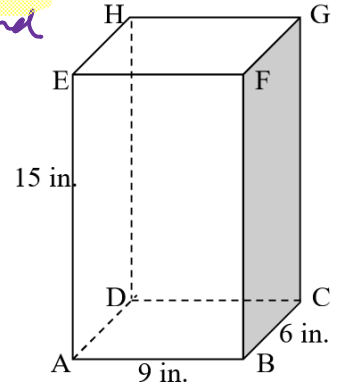
12.1 Surface Area of Prisms

Assume right 3D figures for the following and any shaded face is the base of the prism.

1. Find the lateral surface area and the total surface area of the right rectangular prism below.

LSA = Area of NOT Bases, only the rectangles going around

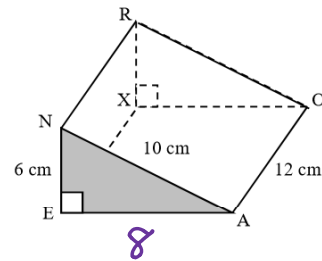
$$\begin{aligned}
 &= 2 \cdot 9 \cdot 6 + 2 \cdot 9 \cdot 15 & \text{TSA} &= \text{all the faces} \\
 &= 108 + 270 & &= 378 + 2 \cdot 6 \cdot 15 \\
 &= 378 \text{ in}^2 & &= 378 + 180 \\
 & & &= 558 \text{ in}^2
 \end{aligned}$$



2. Name of prism: Right triangular prism

Find: Lateral Area: $10 \cdot 12 + 6 \cdot 12 + 8 \cdot 12$
 $= 288 \text{ cm}^2$

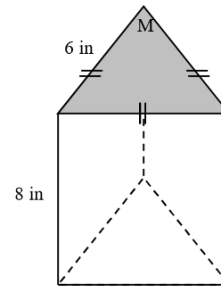
Surface Area: $288 + 2 \cdot \frac{1}{2} \cdot 8 \cdot 6$
 $= 288 + 48 = 336 \text{ cm}^2$



3. Name of prism: Right triangular prism

Find: Lateral Area: $3 \cdot 8 \cdot 6 = 144 \text{ in}^2$

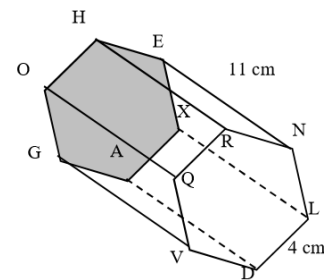
Surface Area: $144 + 2 \cdot \frac{6^2 \sqrt{3}}{4}$
 $= 144 + 18\sqrt{3} \text{ in}^2$



4. Name of prism: Right hexagonal prism

Find: Lateral Area: $6 \cdot 11 \cdot 4 = 264 \text{ cm}^2$

Surface Area: $264 + 2 \cdot 6 \cdot \frac{4^2 \sqrt{3}}{4}$
 $= 264 + 48\sqrt{3} \text{ cm}^2$



12.2 Surface Area of Pyramids

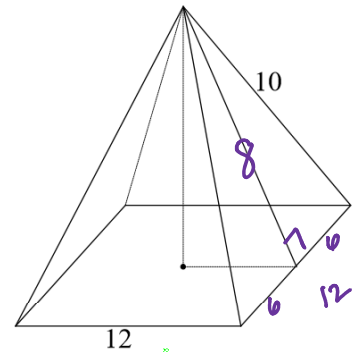
5. **Given:** A pyramid with a square base.

Find: Lateral Area

$$LSA = \frac{1}{2} \cdot 12 \cdot 8 \cdot 4 = 6 \cdot 8 \cdot 4 = 192$$

Surface Area

$$TSA = 192 + 144 = 336$$



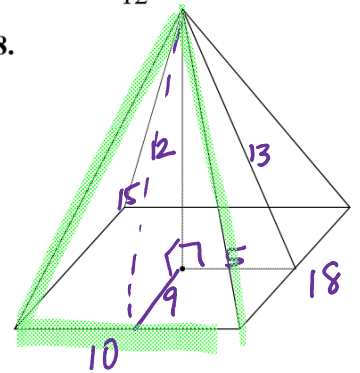
6. **Given:** Height of the pyramid is 12. Dimensions of the base are 10 and 18.

Find: Lateral Area

$$LSA = \frac{1}{2} \cdot 18 \cdot 13 \cdot 2 + \frac{1}{2} \cdot 10 \cdot 15 \cdot 2 = 384$$

Surface Area

$$TSA = 384 + 10 \cdot 18 = 564$$



7. **Given:** The figure at right is a regular triangular pyramid.

$AX = BC = 8$, $AY = 4\sqrt{5}$, find:

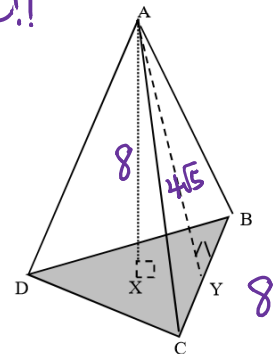
base is EQUILATERAL!!

Find: Lateral Area

$$LSA = \frac{1}{2} \cdot 8 \cdot 4\sqrt{5} \cdot 3 = 48\sqrt{5}$$

Surface Area

$$TSA = 48\sqrt{5} + \frac{8^2\sqrt{3}}{4} = 48\sqrt{5} + 16\sqrt{3}$$



8. A pyramid has a square base and equilateral triangles as faces. If the edges are each 8 cm long, find the lateral surface area, the total surface area of the pyramid, the diagonal of the base and the height of the pyramid.

$$LSA = \frac{8^2\sqrt{3}}{4} \cdot 4 = 64\sqrt{3}$$

$$TSA = 64\sqrt{3} + 64$$

$$\text{diagonal of base} = 8\sqrt{2}$$

$$\text{height of pyramid} = 4\sqrt{2}$$

