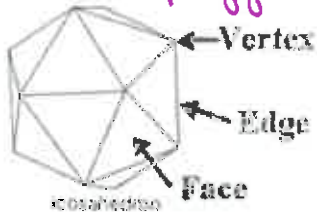
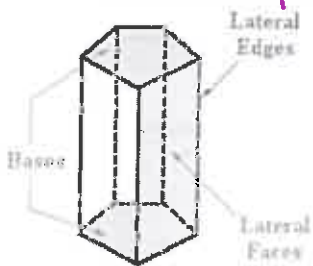


Lateral & Surface Area

Polyhedron: has polygon sides.



Prism: has 2 parallel sides (Bases) → Bases are \cong polygons other sides are all rectangles.



Lateral Area: Area of all sides except the bases

Surface Area: Area of all sides including the bases

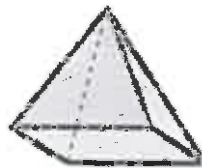
Examples: Label each figure as Polyhedron, Prism, or Neither.



Prism



Prism



Polyhedron



Neither



Prism



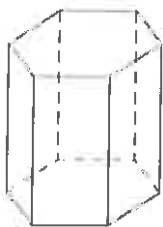
Polyhedron



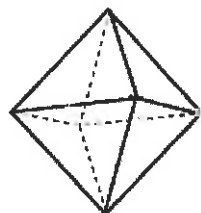
neither



neither



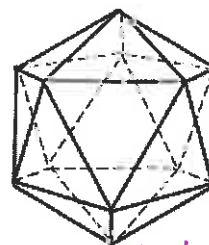
prism



polyhedron



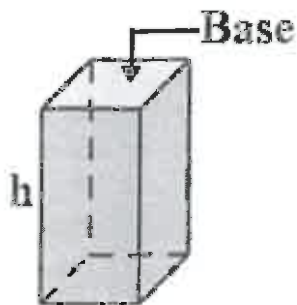
prism



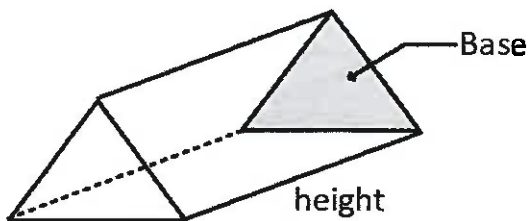
polyhedron

Prisms:

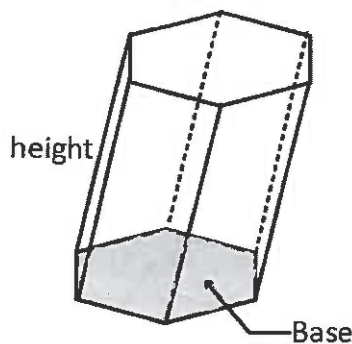
Rectangular



Triangular



Hexagonal

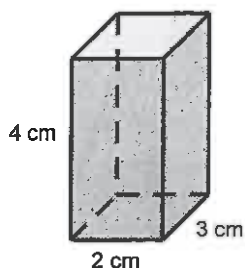


Lateral Area: Add area of all the rectangular sides.

Surface Area: L.A. + the area of both bases.

Examples: Find the Lateral and Surface areas.

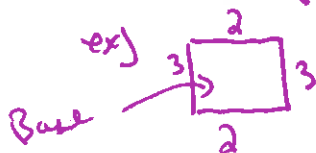
1.



Front/Back $A = 2(4) = 8 \text{ cm}^2$
 Left/Right $A = 3(4) = 12 \text{ cm}^2$
 $L.A. = 8 + 8 + 12 + 12 = 40 \text{ cm}^2$

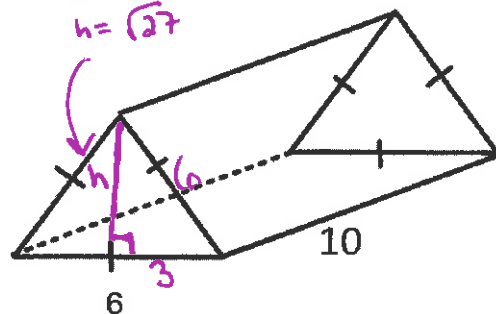
$S.A. = 40 + 2(2 \cdot 3)$
 $= 40 + 2(6)$
 $= 40 + 12$
 $= 52 \text{ cm}^2$

L.A. Short Cut: (Base Perimeter)(Height)



$L.A. = (2+3+2+3)(4)$
 $= 10(4)$
 $= 40 \text{ cm}^2$

2.



$h^2 + 3^2 = 6^2$
 $h^2 + 9 = 36$
 $h^2 = 27$
 $h = \sqrt{27}$

3 Lateral Sides: $A = 6(10) = 60 \text{ sq. units}$

$L.A. = 3 \cdot 60 = 180 \text{ sq. units.}$

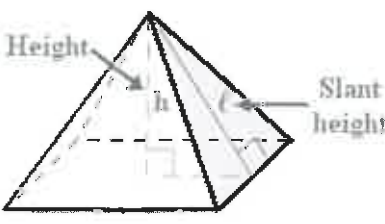

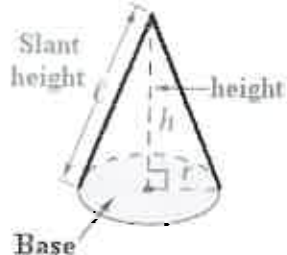
Base Area $= \frac{1}{2}(3)(\sqrt{27}) = \frac{3}{2}\sqrt{27}$

$S.A. = 180 + 2\left[\frac{3}{2}\sqrt{27}\right] = 180 + 3\sqrt{27}$

$\approx 195.6 \text{ sq. units.}$

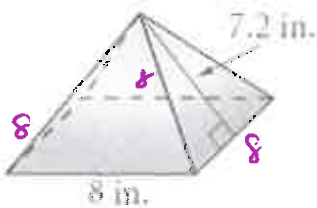
(Base Perm)(height)
 $= (6+6+6)(10)$
 $= 18(10)$
 $= 180 \text{ sq. units.}$

Other Figures:

Pyramid	Cylinder	Cone
		
$L.A. = \frac{1}{2} (\text{Base Perim}) (\text{Slant height})$	$L.A. = (\text{Base Circumference}) (\text{height})$	$L.A. = \frac{1}{2} (\text{Base Circumference}) (\text{Slant height})$
$S.A. = L.A. + \text{One Base}$	$S.A. = L.A. + 2 \text{ Bases.}$	$S.A. = L.A. + \text{one Base.}$

Examples: Find the Lateral and Surface areas.

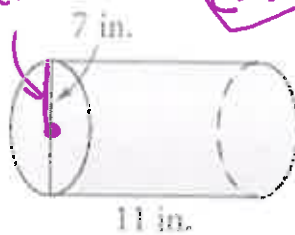
1.



$$\begin{aligned} L.A. &= (\text{Base Perim}) (\text{Slant}) \\ &= (8+8+8+8) (7.2) \\ &= (32) (7.2) \\ &= \boxed{230.4 \text{ in}^2} \end{aligned}$$

$$\begin{aligned} S.A. &= L.A. + \text{one Base} \\ &= 230.4 + (8)(8) \\ &= 230.4 + 64 \\ &= \boxed{294.4 \text{ in}^2} \end{aligned}$$

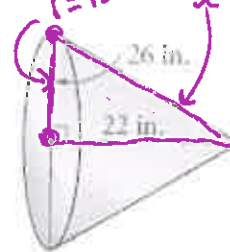
2. Radius = 3.5



$$\begin{aligned} L.A. &= (\text{Base circ.}) (\text{height}) \\ &= 2\pi (3.5) (11) \\ &= 7\pi (11) \\ &= \boxed{77\pi} \\ &\approx \boxed{241.9 \text{ in}^2} \end{aligned}$$

$$\begin{aligned} S.A. &= L.A. + 2 \text{ Bases.} \\ &= 241.9 + 2((3.5)^2 \pi) \\ &= 241.9 + 24.5\pi \\ &\approx \boxed{318.9 \text{ in}^2} \end{aligned}$$

3.



$$\begin{aligned} L.A. &= \frac{1}{2} (\text{Base Circ.}) (\text{Slant}) \\ &= \frac{1}{2} (2\pi \cdot 13) (\sqrt{653}) \\ &= 13\pi (\sqrt{653}) \\ &\approx \boxed{1043.6 \text{ in}^2} \end{aligned}$$

$$\begin{aligned} S.A. &= L.A. + 1 \text{ Base} \\ &= 1043.6 + \pi (13)^2 \\ &= 1043.6 + 169\pi \\ &\approx \boxed{1574.6 \text{ in}^2} \end{aligned}$$

Slant:

$$\begin{aligned} 13^2 + 22^2 &= l^2 \\ 169 + 484 &= l^2 \\ l^2 &= 653 \\ l &= \sqrt{653} \\ &\approx 25.6 \end{aligned}$$