

Volume – Prisms

Notes Section 17.1

Name _____

G.GMD.A.3

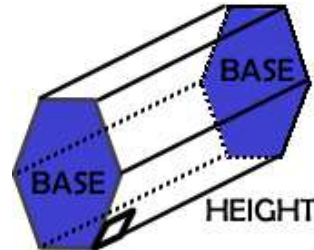
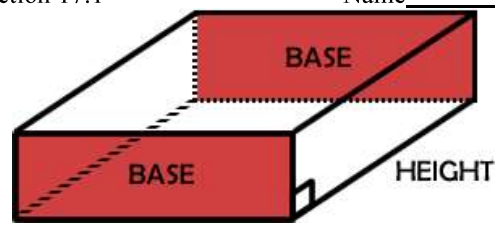
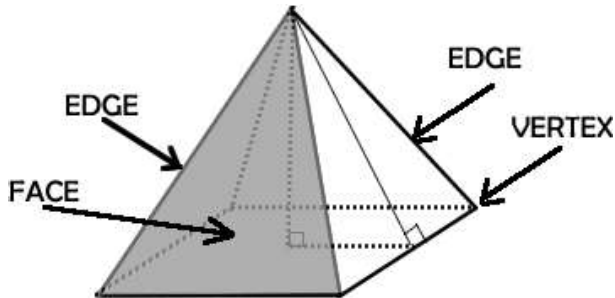
A Solid – A three dimensional closed spatial figure.

A Polyhedron – a geometric solid with polygons as faces.

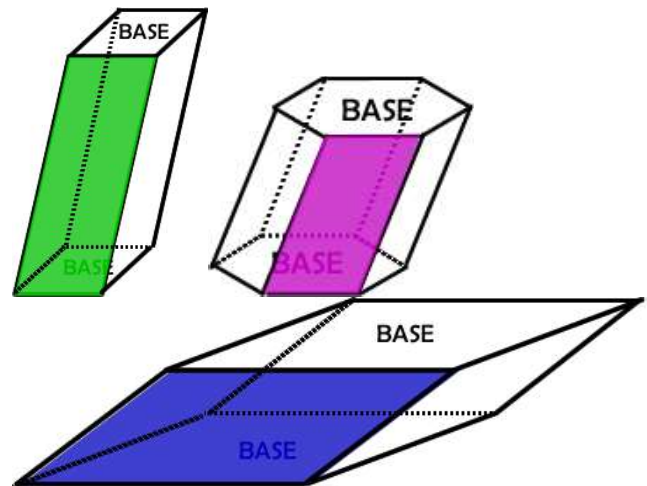
A Face of a Polyhedron – One of the polygons that form the polyhedron. Sometimes these get called sides but the better term is face.

An Edge – The intersection of two faces of a polyhedron.

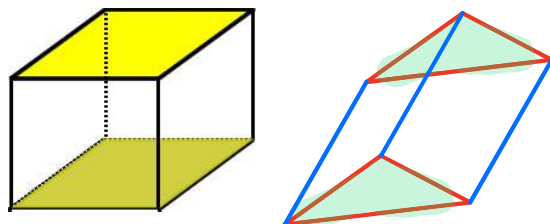
A Vertex – The intersection of two or more edges.



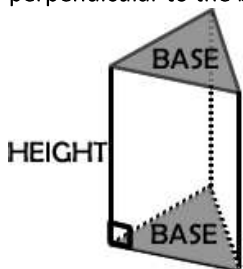
OBLIQUE PRISM: A prism whose lateral faces are NOT ALL perpendicular to the bases.



THE PRISM: is a polyhedron that consists of a polygonal region and its translated image in a parallel plane, with quadrilateral faces connecting the corresponding edges.



RIGHT PRISM: A prism whose lateral faces are perpendicular to the bases.



The two congruent faces that have been translated into parallel planes are called the **bases of the prism**. The faces that are not based are called the **lateral faces**. All of these examples are **right prisms** which mean the base and lateral edges are perpendicular to each other. When working with right prisms the height of the prism is also a lateral edge.

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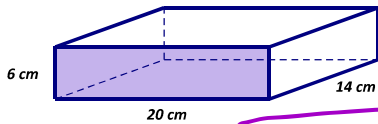
Volume of a Prism

$$V_{\text{prism}} = Bh$$

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

Determine the volume of the following prisms.

1.



$$B = bh$$

$$= (20)(6)$$

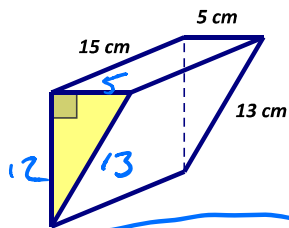
$$B = 120$$

$$V_{\text{prism}} = B \cdot h$$

$$= (120)(14)$$

$$V_{\text{prism}} = 1680 \text{ cm}^3$$

2.



PT
5-12-13

$$B = \frac{1}{2}bh$$

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

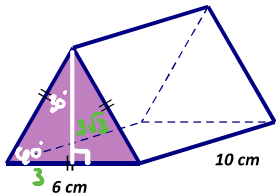
$$B = 30$$

$$V_{\text{prism}} = B \cdot h$$

$$= (30)(15)$$

$$V_{\text{prism}} = 450 \text{ cm}^3$$

3.



$30^\circ - 60^\circ - 90^\circ$
 $x - x\sqrt{3} - 2x$

$$B = \frac{1}{2}bh$$

$$= \frac{1}{2}(6)(3\sqrt{3})$$

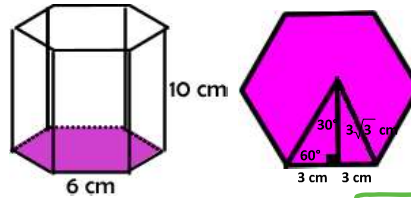
$$B = 9\sqrt{3} \text{ cm}^2$$

$$V_{\text{Prism}} = B \cdot h$$

$$= (9\sqrt{3})(10)$$

$$V_{\text{Prism}} = 90\sqrt{3} \text{ cm}^3$$

4.



$$B = \frac{1}{2}Pa$$

$$= \frac{1}{2}(36)(3\sqrt{3})$$

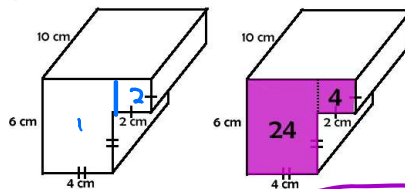
$$B = 54\sqrt{3} \text{ cm}^2$$

$$V_{\text{Prism}} = B \cdot h$$

$$= (54\sqrt{3})(10)$$

$$V_{\text{Prism}} = 540\sqrt{3} \text{ cm}^3$$

5.



$$B = A_1 + A_2$$

$$= 24 + 4$$

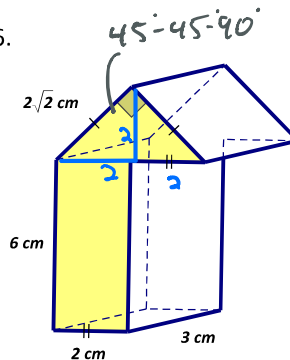
$$B = 28 \text{ cm}^2$$

$$V_{\text{prism}} = B \cdot h$$

$$= (28)(10)$$

$$V_{\text{prism}} = 280 \text{ cm}^3$$

6.



$$B = A_{\text{rec}} + A_{\Delta}$$

$$= b \cdot h + \frac{1}{2}bh$$

$$= (6)(2) + \frac{1}{2}(4)(2)$$

$$= 12 + 4$$

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

$$V_{\text{prism}} = B \cdot h$$

$$= (16)(3)$$

$$V_{\text{prism}} = 48 \text{ cm}^3$$