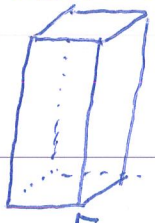
Notes for Volume of Right Angled Prisms

When calculating the volume of prisms the main factor that we must always consider is whether the geometric shape of the base is consistent all the way though the object.

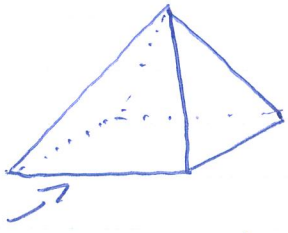
ex) These are consistent

circle goes all way though

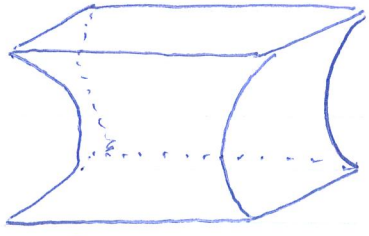


square goes all way though

ex) These are not



square not same as get to top



rectangle changes as go from bottom to top

If the base <u>stays</u> same shape thoughout, then we can use formula

Volume = (Area of Base) × Height

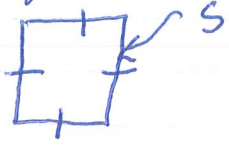
Vol = (A of B) × H

* clarification:

Capital "H" is used for 3-D height as oppose to lower "h" used for 2-D height of geometric figures.

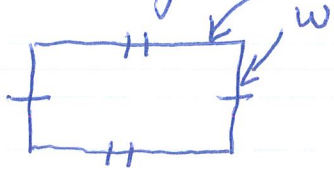
Formulas for Geometric Shapes (memorize)

Square



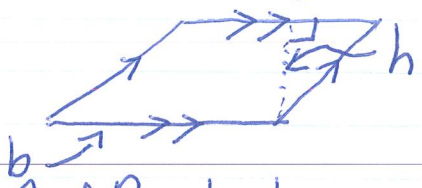
$A of S = s \cdot s$

Rectangle



$A of R = w \cdot l$

Parallelogram

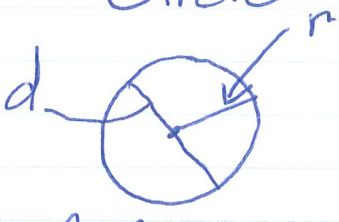


$A of P = b \cdot h$

Triangle

$$A of T = \frac{b \cdot h}{2}$$

Circle



$A of C = \pi \cdot r \cdot r$

should also know

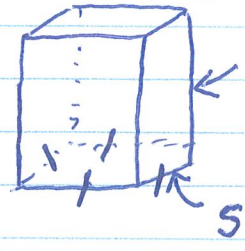
$$r = \frac{d}{2}$$

$$d = 2 \cdot r$$

$Circ = \pi \cdot d$

Examples for Volume

ex)



Square Based Prism

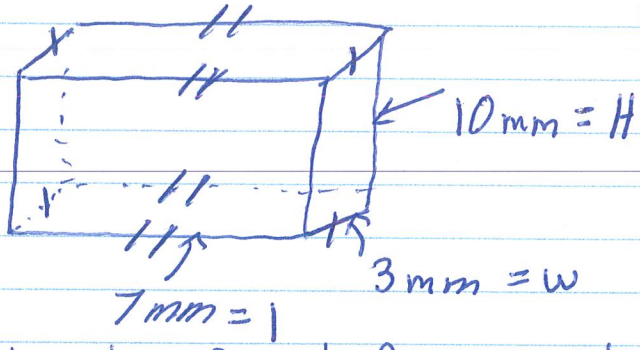
$\underline{Vol} = (A \text{ of } B) \cdot H$

$= (A \text{ of } S) \cdot H$

$= (s \cdot s) \cdot H$

$= 3cm \cdot 3cm \cdot 8cm$

$= 72 cm^3$



Rectangular Based Prism

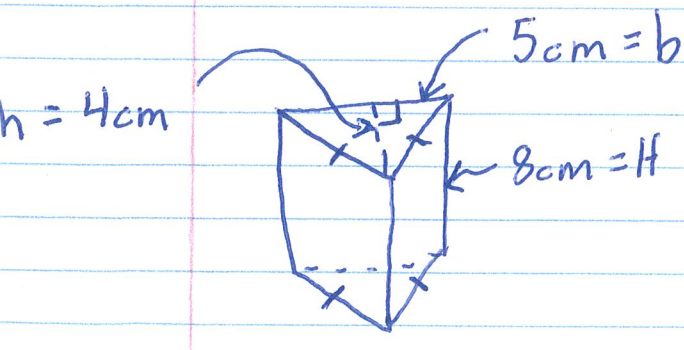
$\underline{Vol} = (A \text{ of } B) \cdot H$

$= (A \text{ of } R) \cdot H$

$= w \cdot l \cdot H$

$= 3mm \cdot 7mm \cdot 10mm$

$= 210 mm^3$



Triangular Based Prism

$Vol = (A \text{ of } B) \cdot H$

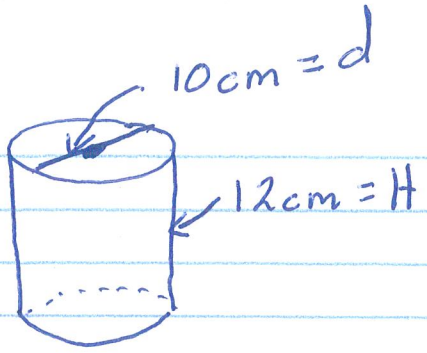
$= (A \text{ of } T) \cdot H$

$= \frac{b \cdot h}{2} \cdot H$

$= \frac{5cm \cdot 4cm}{2} \cdot 8cm$

$= 80 cm^3$

Hilroy



Circular Based Prism

Formulas to Use

① $r = \frac{d}{2}$

② $Vol = (A \text{ of } B) \cdot H$

* since "r" needs to calculated first, must change "d" in to "r"

① $r = \frac{d}{2}$

$= \frac{10cm}{2}$

$= 5cm$

② $Vol = (A \text{ of } B) \cdot H$

$= (A \text{ of } C) \cdot H$

$= \pi \cdot r \cdot r \cdot H$

$\approx 3.14 \cdot 5cm \cdot 5cm \cdot 12cm$

$\approx 942 cm^3$

Hilroy