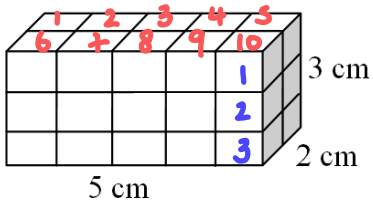
7.2 – VOLUME OF A PRISM

Understanding Volume:

How many 1 cm cubes would you need to build a solid box with dimensions…



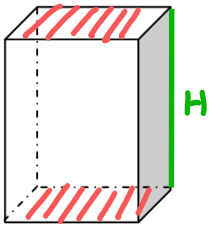
10 × 3 = 30 cubes

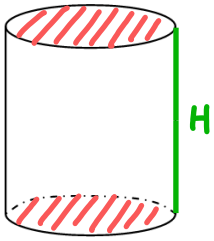
1 cube = 1 cm³ → volume = 30 cm³

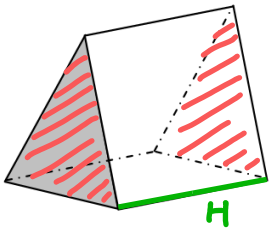
Volume (V) – total amount of space an object occupies

Height of Prism (H) – distance between identical faces of a prism (or cylinder)

(or Cylinder)







Object	rectangular prism	cylinder	triangular prism
Shape of Base	rectangle	circle	triangle

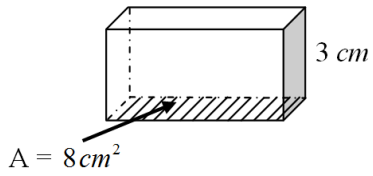
General Formula for Volume:

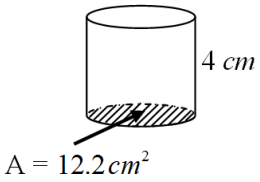
Volume = Area of Base × Height of Prism

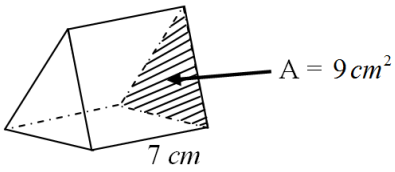
V = A × H

Mathematics 8 – 7.2

Example 1: Calculate the volume given the following.







$V = A \times H$

$= 8 \times 3 = 24\ cm^3$

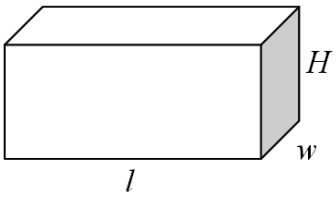
$V = A \times H$

$= 12.2 \times 4 = 48.8\ cm^3$

$V = A \times H$

$= 9 \times 7 = 63\ cm^3$

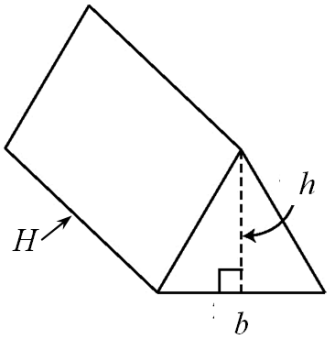
Volume of a Rectangular Prism Shape of Base: rectangle

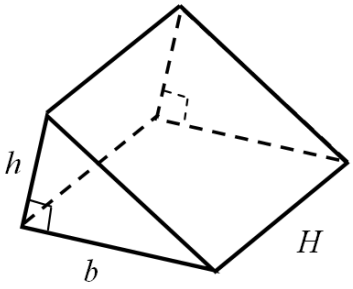


$V = A \times H$

$= l \times w \times H$

Volume of a Triangular Prism Shape of Base: triangle

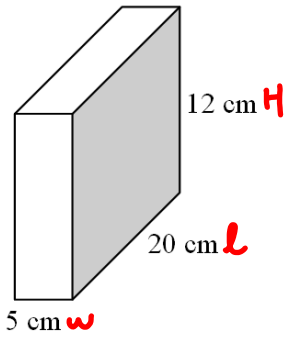




$V = A \times H$

$= \frac{1}{2} bh \times H$

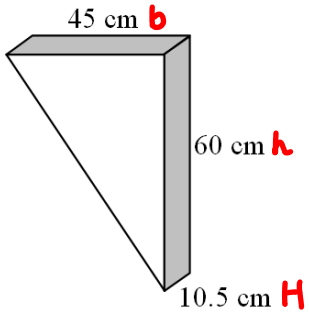
Example 2: Find the volume of the following.



$V = lwH$

$= 20 \times 5 \times 12$

$= 1200\ cm^3$



$V = \frac{1}{2}bh \times H$

$= \frac{1}{2}(45)(60) \times (10.5)$

$= 14\,175\ cm^3$

Example 3: Determine the volume of the water in a 12 cm cube if it is $\frac{3}{4}$ *full.*

$V = l \times w \times H$

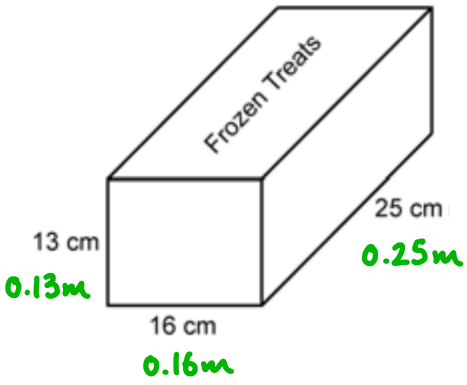
$= 12 \times 12 \times 12$

$= 1728\ cm^3$

$V = \frac{3}{4} \times 1728$

$= 1296\ cm^3$

Example 4: The inside of a freezer has a volume of 3.5 m³. What is the volume of the space left in the freezer after 120 boxes of these frozen treats are placed in it?



$V = lwH$

$= 0.16 \times 0.13 \times 0.25$

$= 0.0052 m^3$

$V = 0.0052 \times 120$

$= 0.624 m^3$

$V = 3.5 - 0.624$

$= 2.876 m^3$

Assignment: p. 258 #4 – 8 (ac), 9, 10, 13, 15, 17, 19