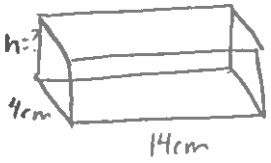
C: Volume of prisms when Area is not given - Continued

Examples:

1. Determine the height of a right rectangular prism if the length is 14cm the width is 4cm and the volume is $140\,cm^3$.



$V = 140cm^3$

$V = A_{base} \times h$

$V = lwh$

$140 = (14)(4)h$

$140 = 56h$

$\frac{140}{56} = \frac{56h}{56}$

$2.5\,cm = h$

2. Determine the height of a right triangular prism if the base is 14cm the height of the triangle is 4cm and the volume is $140\,cm^3$.

$V = 140cm^3$

$V = A_{base} \times h$

$V = \left(\frac{bh_T}{2}\right)h_P$

$140 = \frac{(14)(4)}{2} \times h_P$

$140 = \frac{56}{2} \times h_P$

$140 = 28h_P$

$\frac{140}{28} = \frac{28h_P}{28}$

$5cm = h_P$

3. The ratio of length: width: height of a box is 12 : 6 : 2. What is its volume if the height is 10 cm?

$l : w : h$
$12 : 6 : 2$

$w : h$
$6 : 2$

$\frac{6}{w} = \frac{2}{10}$

$\frac{6}{w} \times \frac{2}{10}$

$\frac{2w}{2} = \frac{60}{2}$

$w = 30\text{cm}$

$l : h$
$12 : 2$

$\frac{12}{l} \times \frac{2}{10}$

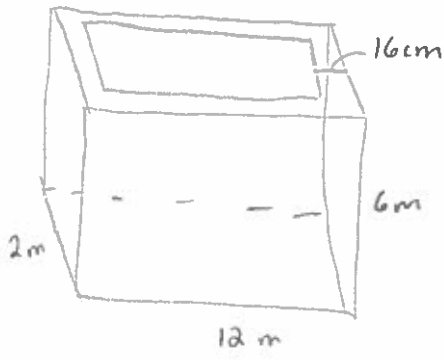
$2l = 120$

$\frac{2l}{2} = \frac{120}{2}$

$l = 60\text{cm}$

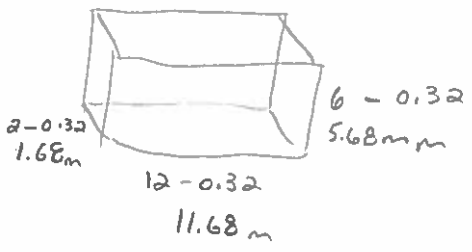
$V = A_{base} \times h$
$= l w \times h$
$= (60)(30)(10)$
$= 18\,000\text{cm}^3.$

4. A tank has outside dimensions of 12m x 6m x 2m. It has no lid. The tank is 16cm thick. What is the maximum volume the tank can hold?



* Need to find measurements of inside of the tank.

Inside



$V = A_{base} \times h$
$= l w \times h$
$= (11.68)(1.68)(5.68)$
$= 111.455232\ \text{cm}^3$

Assignment Pg. 260 # 11 – 17, 19, 20, 22