Measurement:
Volume of Prisms and Pyramids

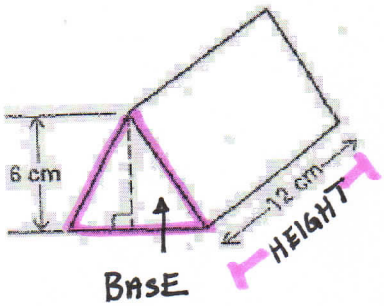
Date: Notes

VOLUME IS: The amount of space occupied by an object, measured in CUBIC units. (eg. cm^3)

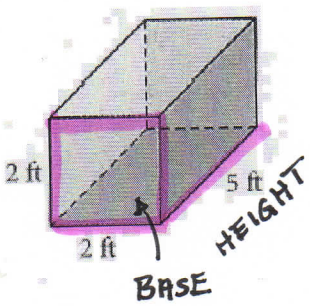
VOLUME OF ALL PRISMS: Area of Base x Height

Example 1: What is the base and the height of each shape?

a)

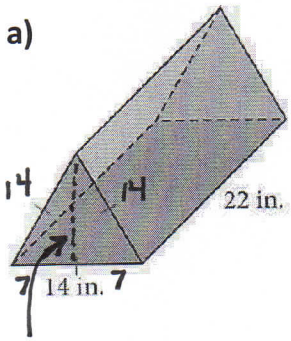


b)



Example 2: Calculate the volume of the prisms

a)



Height of Triangle

$c^2 = a^2 + b^2$

$(14)^2 = (7)^2 + b^2$

$196 = 49 + b^2$

$196 - 49 = b^2$

$147 = b^2$

$12.1 = b$

∴ height of triangle is 12.1 in.

V = area of base x height

$= \left(\frac{bh}{2}\right) \times h$

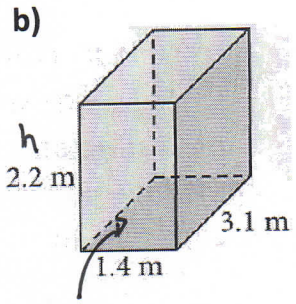
$= \left(\frac{(14)(12.1)}{2}\right) \times 22$

$= 84.7 \times 22$

$= 1863.4 \text{ in}^3$

∴ volume is 1863.4 in^3.

b)



V = area of base x height

V = l x w x h

= 3.1 x 1.4 x 2.2

= 9.55 m^3

∴ volume is 9.55 m^3.

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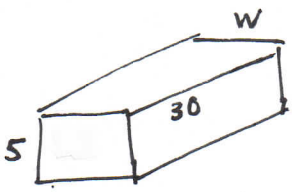
Example 3: A pool contains a volume of 6,750 ft^3 of water.



a) If the pool is 30ft ~~wide~~ long and 5ft deep, how wide is the pool?

$V = lwh$

$6750 = (30)w(5)$

$\frac{6750}{150} = \frac{150w}{150}$

$45 = w$ ∴ width is 45 ft.

b) If you can swim at a rate of 2 ft/s, how long would it take you to swim the width of the pool? (Round your answer to the nearest minute)

$\frac{45}{x} = \frac{2}{1}$ ∴ it would take 22.5 sec.

sec

$\frac{45}{2} = \frac{2x}{2}$

$22.5 = x$

convert to min

$\frac{22.5}{60}$

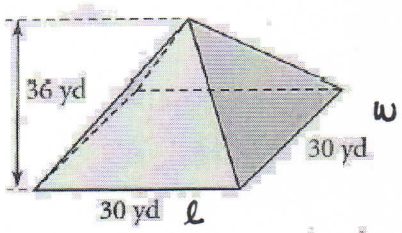
$= 0.375$ min.

VOLUME OF A PYRAMID: $\frac{\text{area of base} \times \text{height}}{3}$

****The volume of a pyramid is** 1/3 volume of a prism ******

Example 4: Calculate the area of the pyramids

a)



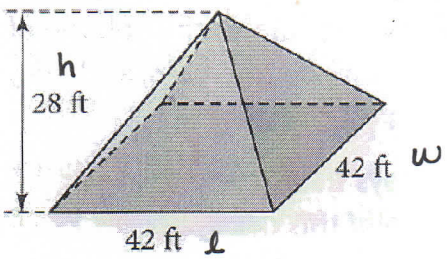
$V = \frac{\text{area of base} \times \text{height}}{3}$

$V = \frac{lwh}{3}$

$= \frac{(30)(30)(36)}{3}$

$= 10\,800\ yd^3$.

b)



$V = \frac{lwh}{3}$

$= \frac{(42)(42)(28)}{3}$

$= 16\,464\ ft^3$