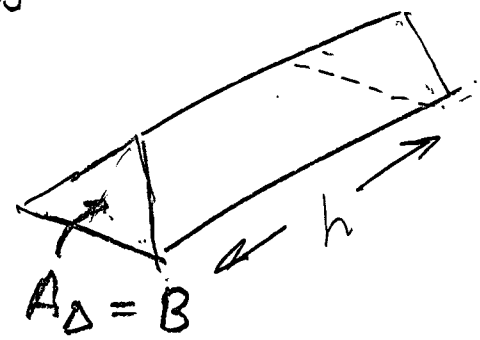
Geometry | Tuesday 3-19-13 | Class Notes

Ch 11-2 Volume of Prisms and Cylinders

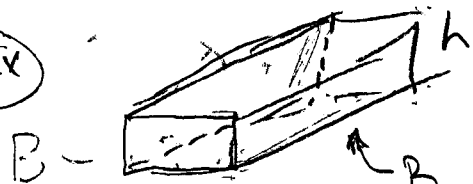
B = base Area (Area of one base)

Volume of Prisms

$V = Bh$ (Ex)



(Ex)



$A_\square = B$

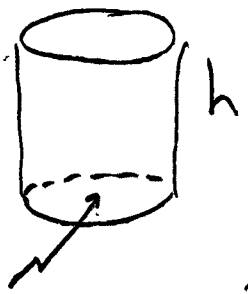
The Volume of a cube with edge X is $V = X^2 X$ ↙ B

$\therefore \boxed{V = X^3}$

Volume of Cylinder:

$V = Bh = (\pi r^2)h$

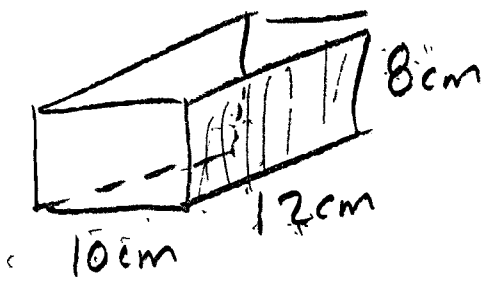
B Area of one base



$V_{\odot} = B = \pi r^2$

Ex 1 P5749

(A) V to nearest tenth



$B = (10)(12)$

$B = 120 cm^2$

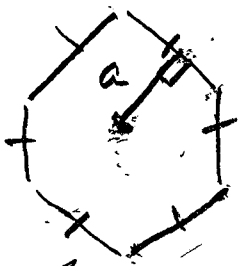
$V = Bh = (120)(8) = \boxed{960 cm^3}$

(B) V of cube with side 10cm

$10^3 = \boxed{1000 cm^3}$

Apothem the perpendicular distance from the center of a regular polygon to one side.

(Ex)



Area of Reg. Polygon

Use to find B ⇒ $A = \frac{1}{2} a P$ Pg 689

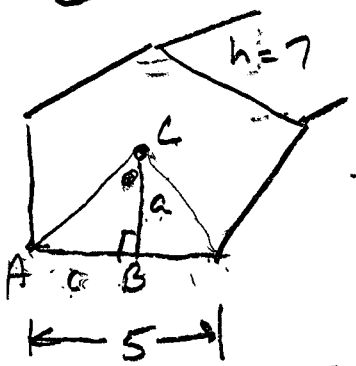
apothem perimeter

(Ex) (C) Right, regular, pentagonal prism. Pg

Edges meet bases at 90°

edges = 5m h = 7m

B = Area of regular pentagon



$m\angle ACB = \frac{360}{10} = 36°$

$\tan 36 = \frac{c}{a} = \frac{\frac{5}{2}}{a}$

$a \tan 36 = \frac{5}{2}$ $\therefore a = \frac{2.5}{(.7265)} = 3.441$

$\therefore B = \frac{1}{2}(3.441)(5 \cdot 5) = 43.01 m^2$

perimeter

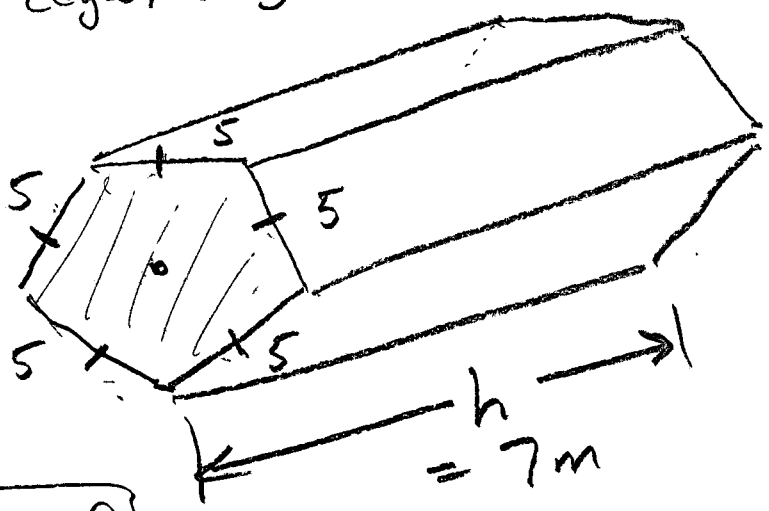
(See next page for larger version)

$V = Bh = (43.01)(7) = \boxed{301.07}$

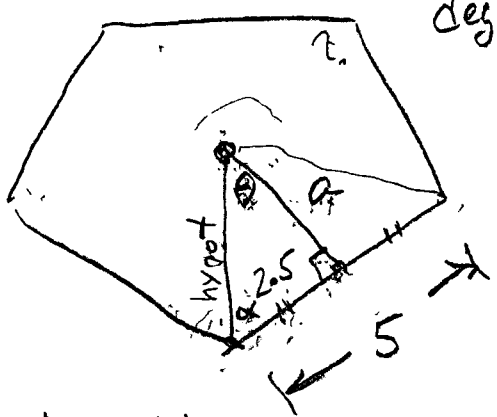
B h

$\boxed{301.1 m^3}$ *

(Ex) Right, regular pentagonal prism
Edges are 5m
height = 7m
V = ?



$$A = \frac{1}{2}aP$$



deg. in pentagon
$= \frac{540}{5}$
$= 108°$

theta
$\theta = ?$ find a

$\tan\theta = \frac{2.5}{a}$

$\theta = \frac{360}{10} = 36°$

$\tan 36 = \frac{2.5}{a}$

$a = \frac{2.5}{(.7265)}$

$a = 3.441$

alpha
$\alpha = ?$ find a

$\tan\alpha = \frac{a}{2.5}$

$\alpha = \frac{108}{2} = 54°$

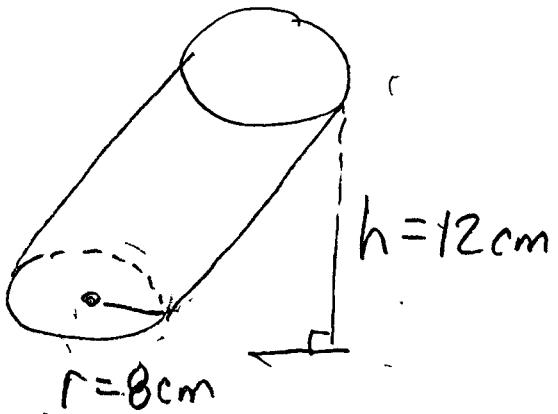
$2.5(\tan 54°) = a$

$2.5(1.3764) = a$

$3.441 = a$

$V = \left[\frac{1}{2}(3.441)25\right]7 = 301.07 = \boxed{301.1\,m^3}$

(Ex3) Volume of cylinder, nearest tenth
Pg751



$V = Bh = (\pi r^2)\, h$

$= 3.1416(8)^2 12$

$= 2412.74 = \boxed{2412.7\ cm^3}$

(B) Volume, cylinder, $B = 36\pi\ in^2$ $(r^2\pi)$ $\therefore r = 6$

with height equal to twice radius

$\therefore h = 12$

$A_{\square} = Bh = (36\pi)\, 12$

$\cong 1357.17\ in^3 \approx \boxed{1357.2\ in^3}$

Exploring effect of changing dimensions —

(Ex 4) pg 752 r, h of cylinder multiplied by $\frac{1}{2}$, effect on volume?

$r = 6$ m, $h = 12$ m

$(\frac{1}{2}) \Rightarrow r = 3$, $h = 6$

$V_{Big} = Bh = (\pi 6^2)12$
$= 432\pi \text{ m}^3$

$V_{SMALL} = Bh$
$= (\pi 3^2)6$
$= 54\pi$

$\therefore V_{CHANGED}$ $\frac{54\pi}{432\pi} = \frac{6}{48} = \boxed{\frac{1}{8}}$

Homework: Pg 753, # 2 to 9