Geometry Monday 4-1-13 Class Notes

Ch. 11-3 Volume of Pyramids and Cones.

Pyramid: $V = \frac{1}{3} B h$

B = base Area } depends on shape

Cone: $V = \frac{1}{3} B h$

B = base area } Always πr^2

Pg 757

(Ex) $V = ?$ Rectangular Pyramid

$L = 7 ft$ $W = 9 ft$ $h = 12 ft$

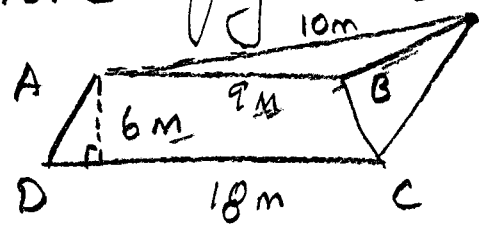
(Ex) $V = ?$ Square Pyramid

$S = 4 in$ $h = 6 in$.

(Ex) trapezoidal pyramid where $\overline{AE} \perp$ to base.

Pg 758

base



$V = ?$

(Ex) $V = ?$ Cone, $r = 5cm$, $h = 12cm$

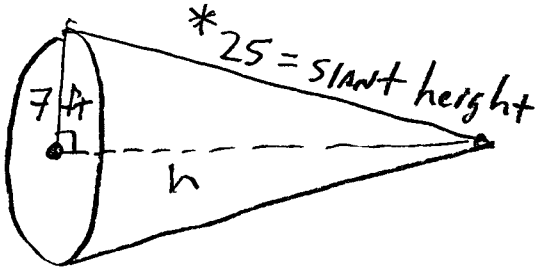
Pg 759

2 answers, exact, approximate (nearest tenth)

$0.X$

(Ex) $V = ?$ Cone with base circumference $= 21\pi$ and h is 3cm less than twice the radius.

(Ex)



Book is wrong and points to the h for 25, the book calculation is OK.

The book has a nice picture of how a cube can be broken into 3 identical pyramids which leads to the $V = \frac{1}{3}(B)h$

(B) = volume of cube

A French web side has video instructions for a net to build these 3 identical pyramids to show they are each $\frac{1}{3}$ of the volume of the cube. It is at:

www.lapasserelle.com/online_courses/maths61...

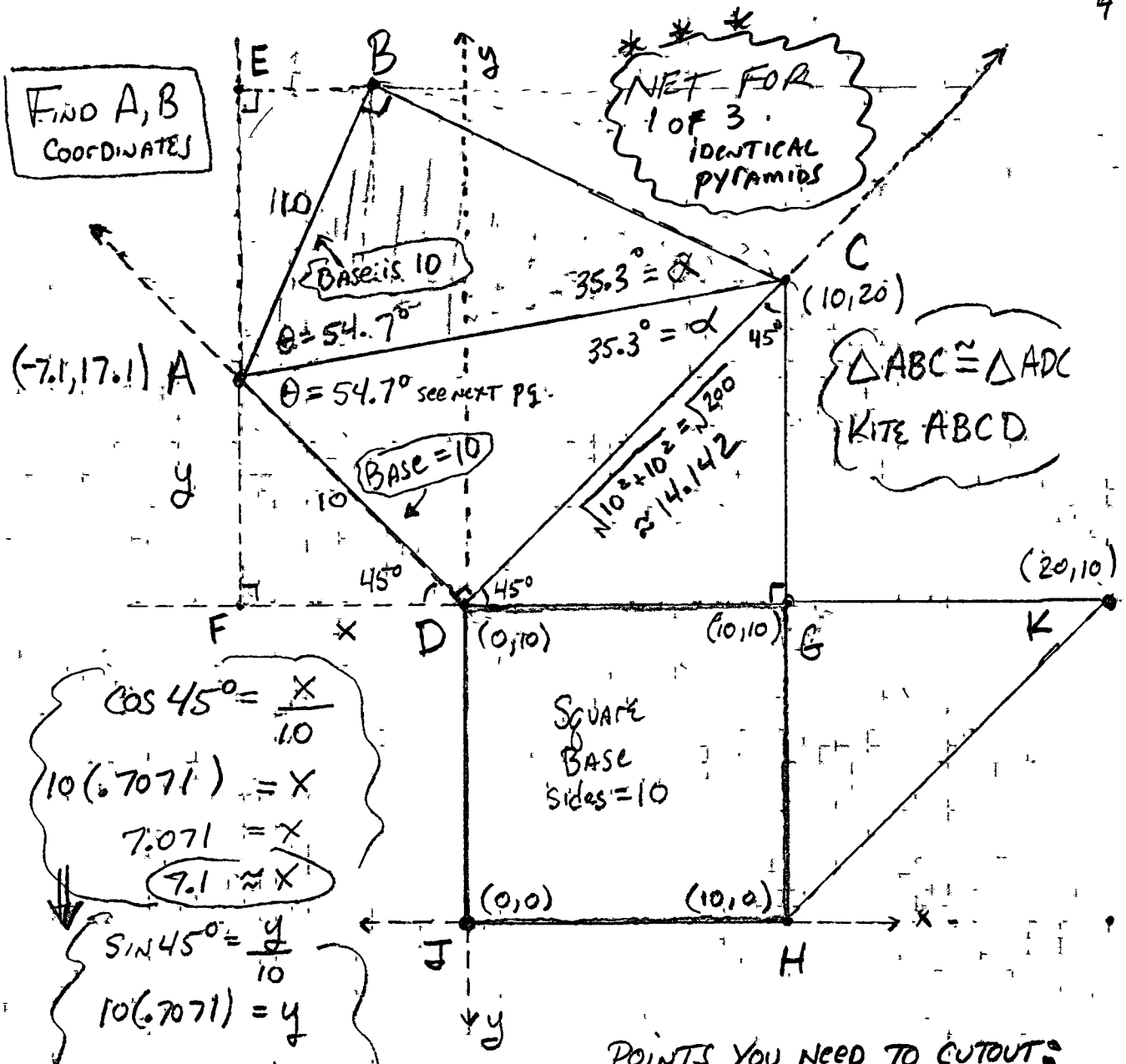
...3_pyramids_in_a_cube/index.html

For Quiz 3

Bonus: build it - put name on each pyramid with a sharpie.

2x Bonus: Put pics or video of you building it online

3x Bonus: Change dimensions, show math for net, build-it (see next 3 pages)



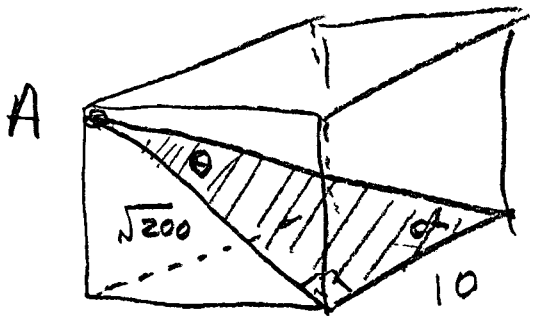
POINTS YOU NEED TO CUTOUT:

B is A little more work to find.

AND B(-2.8, 26.1) see pg 5 & 6 →

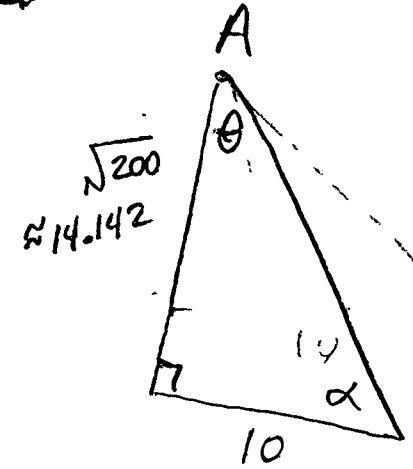
C(10,20)
D(0,10)
G(10,10)
J(0,0)
H(10,0)

K(20,10)



NOTE: $\tan 45^\circ = 1$

FIND θ



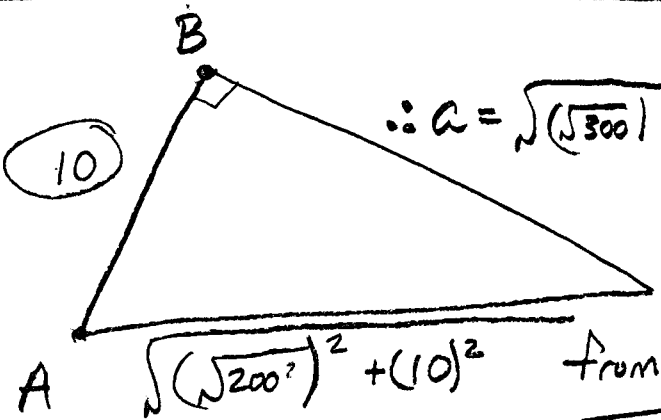
$\theta = \tan^{-1}\left(\frac{14.142}{10}\right)$

$\theta \approx 54.736^\circ$

$\tan\theta > 1$

$\therefore \alpha \approx 90 - 54.736^\circ \approx 35.264^\circ = \alpha$

$\tan\theta < 1$



$\therefore a = \sqrt{(\sqrt{300})^2 + 10^2} = \sqrt{300-100}$

$a = \sqrt{200} \approx 14.142$

$\sqrt{(\sqrt{200})^2 + (10)^2}$ from "A" CALCULATION ABOVE

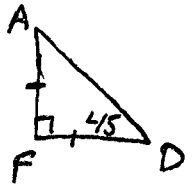
$= \sqrt{200+100} = \sqrt{300}$

≈ 17.321

$\therefore \triangle ABC \cong \triangle ADC$

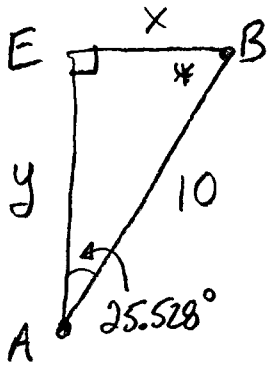
AND ABCD IS A KITE.

$m\angle DAF = 45^{-0}$



$\therefore m\angle BAE = 180° - (45° + 2(54.736°))$

$= 25.528°$



Find X

$\therefore \sin 25.528° = \frac{X}{10}$

$10(.4310) = X$

$4.310 = X$

$\therefore$ X coordinate of B

$\Rightarrow$ X coordinate of A $- 4.310$

$\Rightarrow 7.071 - 4.310$

$= 2.761 \Rightarrow -2.761 = B_x$

$-2.8 = B_x$

* NOTE: $m\angle EBA = 90 - 25.528° = 64.472°$

Find y

$\cos 25.528° = \frac{y}{10}$

$10(.9024) = y$

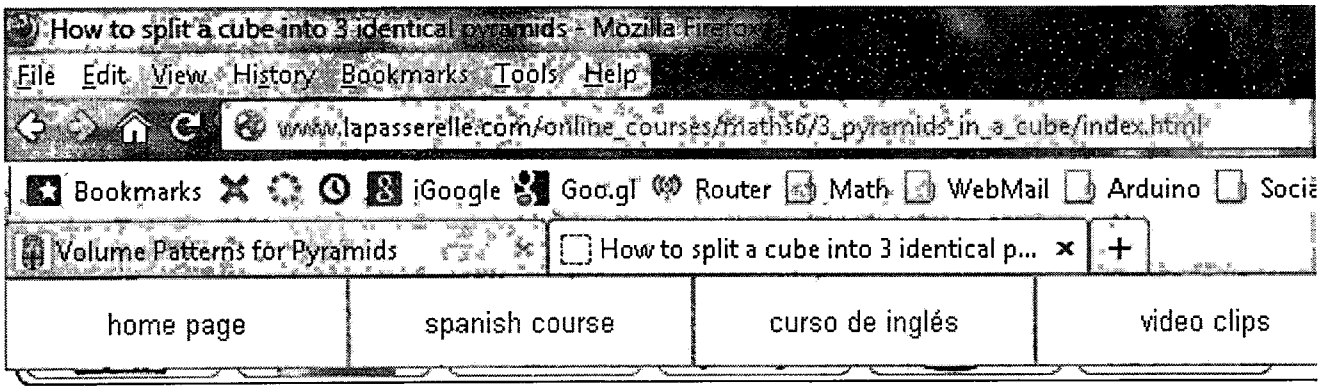
$9.024 = y$

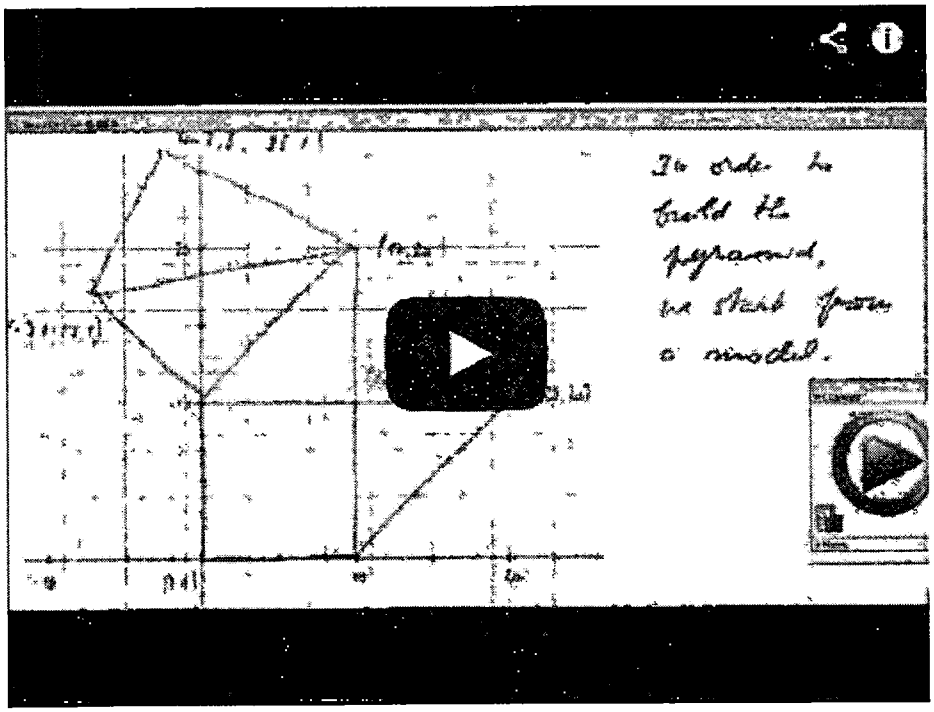
$\therefore$ y coordinate of B

$\Rightarrow$ y coordinate of A $+ 9.024$

$\Rightarrow 17.1 + 9.024 = 26.124$

$\Rightarrow B_y = +26.1$

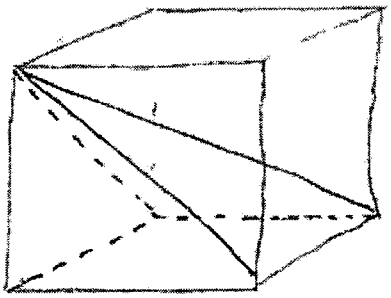




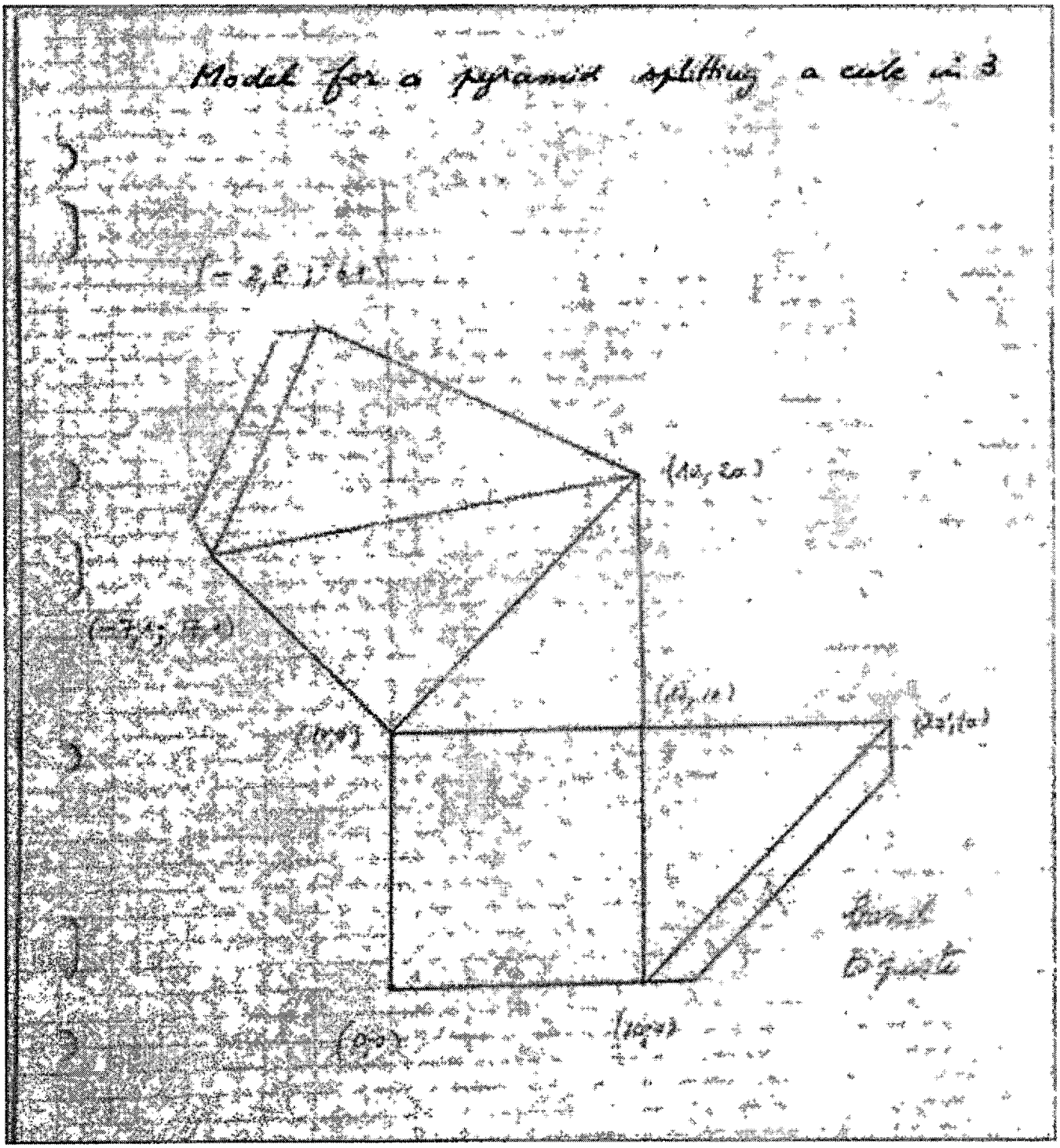
Vers le même cours en français

Text

We shall build with cardboard and glue a pyramid fitting into a cube.



Screenshot from French site

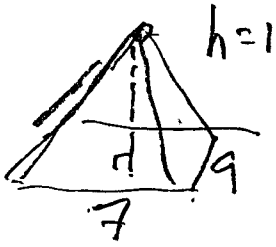


Screenshot from French site

(Ex) $V = ?$ Rect. Pyramid

$L = 7ft \quad W = 9ft \quad h = 12ft$

B



$V = .63ft^2 \cdot 12ft \cdot \frac{1}{3}$

$V = \frac{756ft^3}{3} = 252ft^3$

(Ex) $V = ?$ Square Pyramid

$S = 4in \quad h = 6in$

$V = \frac{1}{3}Bh$

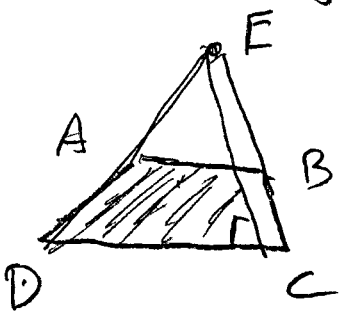
$V = (16in^2)(6in) \cdot \frac{1}{3}$

$V = \frac{96in^3}{3} = 32in^3$

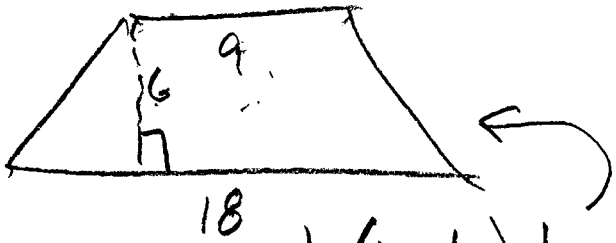
(Ex) trapezoidal pyramid, $\overline{AE} \perp$ BASE

$\overline{AE} = 10\,m$

$h =$?



BASE



$B_{AREA} = \frac{1}{2}(b_1 + b_2)h$

$= \frac{1}{2}(27)6$

$\therefore V = (8.1\,m^2)(10\,m)\frac{1}{3}$

$$\boxed{V = 270\,m^3}$$

(Ex) $V = ?$ CONE, $r = 5\,cm$ $h = 12\,cm$

EXACT, APPROX. (NEAREST tenth)

$0.XYZ$ ↑

$\boxed{V = \frac{1}{3}Bh}$ $V = \frac{1}{3}(\pi(5)^2)12$

$$\boxed{V = 100\pi\,cm^3}$$ EXACT

APPROX $V = 100(3.1416)\,cm^3$

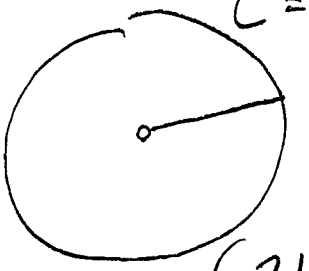
$$\boxed{V = 314.2\,cm^3}$$ APPROX

(Ex) $V = ?$ Cone, base circumference $= 21\pi$ cm

$C = 2\pi r$

$C = 21\pi$

$h = 3$ cm less than twice the radius.



$(21\pi) = 2\pi r \Rightarrow \frac{21\pi}{2\pi} = r$

$\boxed{C = 2\pi r}$

$10.5 = r$

$\therefore 18 = h$

$V = \frac{1}{3} B h = \frac{1}{3}\left(\pi(10.5)^2\right)18$

↓ 目

$= 6\pi(110.25)$

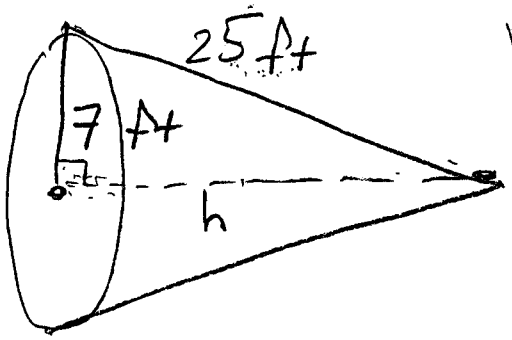
$\boxed{V = 661.5\pi \text{ cm}^3}$ EXACT

$V \approx 2078.1684$

$\boxed{V \approx 2078.2 \text{ cm}^3}$ Approx

(Ex)

C

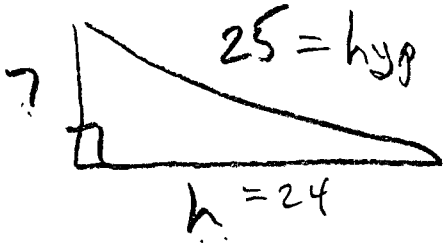


$V = ?$

$= \frac{1}{3} B h$

(πr^2)

$= \left(\frac{1}{3} \cdot 49 \cdot \pi\right) h$



$= \frac{1}{3} \cdot 49 \cdot \pi \cdot 24^{8}$

$= \boxed{392\pi \text{ ft}^3}$ EXACT

$25^2 - 7^2 = h^2$

$625 - 49 = h^2$

$576 = h^2$

$24 = h$

$(392)(3.1416)$

$= 1231.507$

$V = \boxed{1231.5 \text{ ft}^3}$

APPROX