Lesson Title 11.6 Pyramids & Cones NOTES **HGEO** **Date** _____

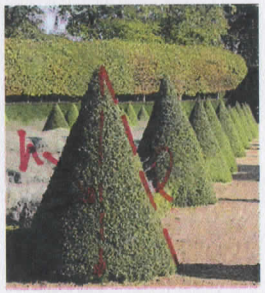
OBJECTIVE 1: Terminology

TASK 1: Answer the questions and label on the real life images.

a) What is the difference between the height and slant height?

b) Label the height and slant height in each picture. Use h for height and a cursive lowercase L for slant height.

h ℓ



OBJECTIVE 2: Volume of a Pyramid

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

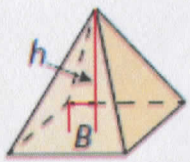
****Case of the letters still matter!!****

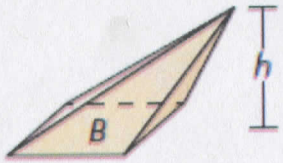
V = volume in units cubed

B = Area of the base

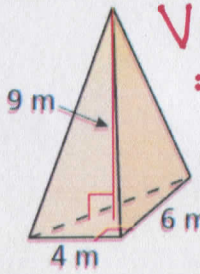
h = height of the pyramid

TASK 2: Find the volume of the pyramid. Include the set-up and the answer with appropriate units.





a)



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

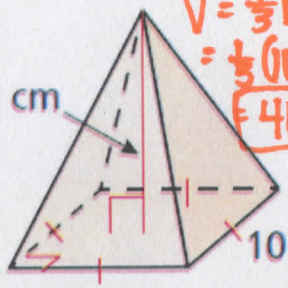
$= \frac{1}{3}(\frac{1}{2}bh)(h)$

$= \frac{1}{3}(\frac{1}{2}(6)(4))(9)$

$= (12)(3)$

$= 36\ m^3$

b)

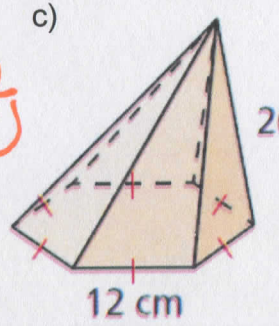


$V = \frac{1}{3}Bh$

$= \frac{1}{3}(10^2)(12)$

$= 400\ cm^3$

c)



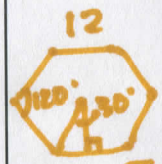
$V = \frac{1}{3}Bh$

$= \frac{1}{3}(216\sqrt{3})(20)$

$= (72\sqrt{3})(20)$

$= 1440\sqrt{3}\ cm^3$

$\approx 2494.153\ cm^3$



$a = 6\sqrt{3}$

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

$= \frac{1}{2}(6\sqrt{3})(6\cdot$

$= 216\sqrt{3}\ cm^2$

OBJECTIVE 3: Volume of a Cone

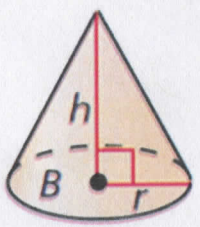
$V = \frac{1}{3}Bh = \frac{1}{3}\pi r^2 h$

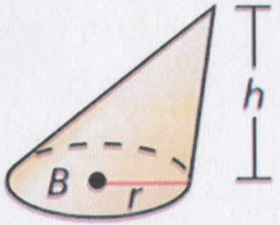
****Case of the letters still matter!!****

V = volume in units cubed

B = Area of the base

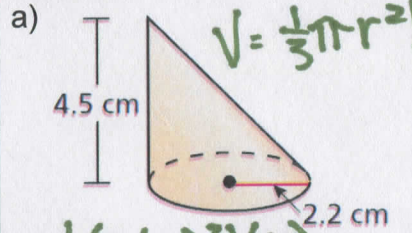
h = height of the cylinder





TASK 3: Find the volume of each cone. Show the set up. Be sure to include correct units.

a)



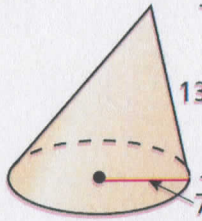
$V = \frac{1}{3}\pi r^2 h$

$= \frac{1}{3}(\pi(2.2)^2)(4.5)$

$= 7.26\pi \text{ cm}^3$

$\approx 22.808 \text{ cm}^3$

b)



$V = \frac{1}{3}\pi r^2 h$

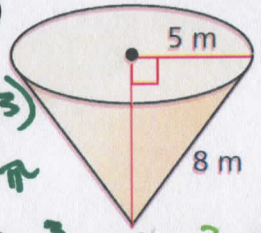
$= \frac{1}{3}\pi(7)^2(13)$

$= \frac{1}{3}(637)\pi$

$\approx 212.333\pi \text{ in}^3$

$\approx 667.065 \text{ in}^3$

c)



$8^2 - 5^2 = h^2$

$h = \sqrt{39}$

$V = \frac{1}{3}\pi r^2 h$

$= \frac{1}{3}(\pi)(5)^2(\sqrt{39})$

$= \frac{1}{3}(25\pi)(\sqrt{39})$

$= \frac{25\pi\sqrt{39}}{3} \text{ m}^3$

$\approx 163.494 \text{ m}^3$

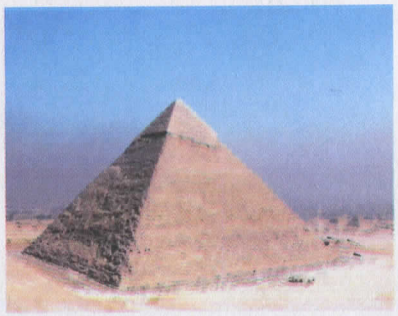
TASK 4: Real-World Application

a) Originally, Khafre's Pyramid had a height of about 144 meters and a volume of about 2,218,800 cubic meters. Find the side length of the square base.

$2{,}218{,}800 = \frac{1}{3}(s^2)(144)$

$46{,}225 = s^2$

$s = 215 \text{m}$

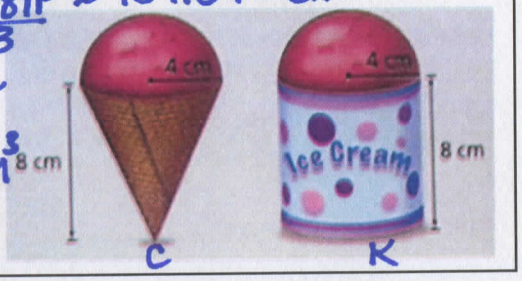


b) Caleb gets a scoop of ice cream in a cone and Keegan gets a scoop in a cylindrical cup. Each container has a height of 8 cm and a radius of 4 cm. Each scoop of ice cream has an approximate volume of 268 cm^3. If the ice cream melts, who would have the bigger mess on their hands? Caleb

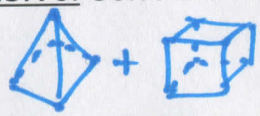
C: $\frac{1}{3}(\pi(4)^2)(8) = \frac{128\pi}{3} \approx 134.041 \text{ cm}^3$

K: $(\pi(4)^2)(8) = \frac{128\pi}{3}$

$= 402.124 \text{ cm}^3$



TASK 5: Solve the following composite solids.

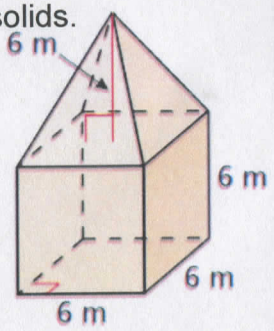
a) 

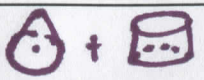
$V = \frac{1}{3}Bh + Bh$

$= \frac{1}{3}(s^2)(h) + (s^2)(h)$

$= \frac{1}{3}(6)^2(6) + (6)^2(6)$

$= 72 + 216$ $= 288 m^3$



b) 

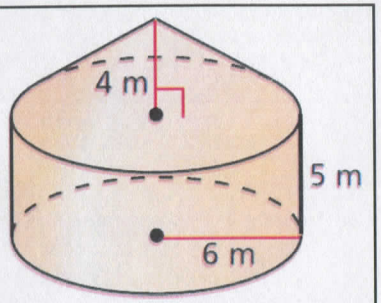
$V = \frac{1}{3}Bh + Bh$

$= \frac{1}{3}(6^2\pi)(4) + (6^2\pi)(5)$

$= 48\pi + 180\pi$

$= 228\pi\ m^3$

$\approx 716.283\ m^3$



TASK 6: Set up the proportions and solve for the volume.

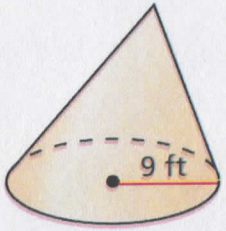
a) Cone A

$V = 15\pi\ ft^3$

$\left(\frac{3}{9}\right)^3 = \frac{15\pi}{x}$

$\frac{27}{729} = \frac{15\pi}{x}$

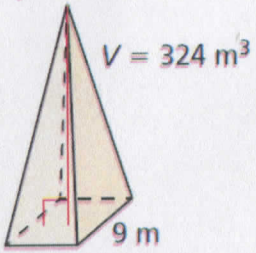
Cone B



$= 405\pi\ ft^3$

$\approx 1,272.345\ ft^3$

b) Pyramid C



$\left(\frac{3}{9}\right)^3 = \frac{x}{324}$

$\frac{27}{729} = \frac{x}{324}$

Pyramid D

$12 m^3$

Common mistakes:

Still need help with: