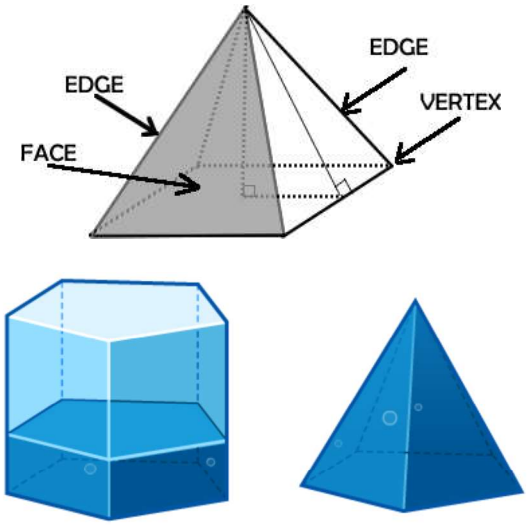
Volume – Pyramids & Spheres

G.GMD.A.3 Notes Section 17.3 Name_____

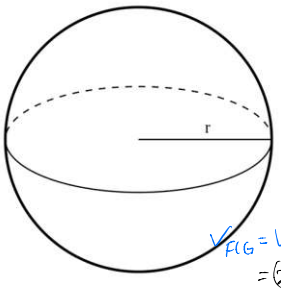
Volume of a Pyramid

$$V_{Pyramid} = \frac{1}{3}Bh$$



Volume of a Sphere

$$V_{Sphere} = \frac{4}{3}\pi r^3$$



$V_{FIG} = V_{CYL} + \frac{1}{2}V_{\odot}$

$= (216\pi + 144\pi)\,cm^3$

$V_{FIG} = 360\pi\ cm^3$

$V_{CYL} = Bh$

$= \pi r^2 h$

$= \pi(6)^2 6$

$V_{CYL} = 216\pi\ cm^3$

$\frac{1}{2}V_{\odot} = \frac{1}{2}\left(\frac{4}{3}\pi r^3\right)$

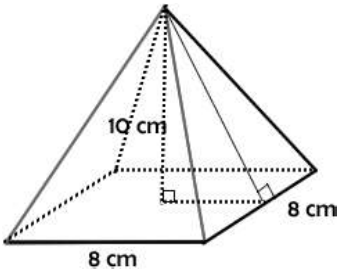
$= \frac{2}{3}\pi(6)^3$

$= \frac{2}{3}\pi(216)^{72}$

$\frac{1}{2}V_{\odot} = 144\pi\ cm^3$

Determine the volume of the following.

1.



$B = bh$

$B = 8(8)$

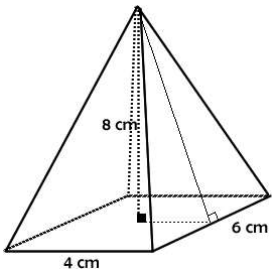
$B = 64\ cm^2$

$V_{PYR} = \frac{1}{3}Bh$

$V_{PYR} = \frac{1}{3}(64)(10)$

$V_{PYR} = \frac{640}{3}\ cm^3$

2.



$B = bh$

$= 4(6)$

$B = 24$

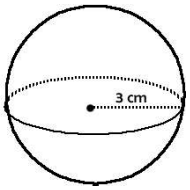
$V_{PYR} = \frac{1}{3}Bh$

$V_{PYR} = \frac{1}{3}(24)(8)$

$V_{PYR} = 64\ cm^2$

Determine the volume of the following.

3.



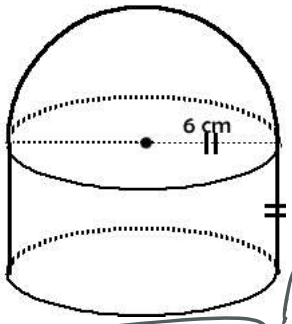
$V_{\odot} = \frac{4}{3}\pi r^3$

$= \frac{4}{3}\pi(3)^3$

$= \frac{4}{3}\pi(27)^9$

$V_{\odot} = 36\pi\ cm^3$

4.



$V_{FIG} = \frac{1}{2}V_{\odot} + V_{\square}$

$= 144\pi + 216\pi$

$V_{FIG} = 360\pi\ cm^3$

$\frac{1}{2}V_{\odot} = \frac{1}{2}\left(\frac{4}{3}\pi r^3\right)$

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

$= \frac{2}{3}\pi(216)^{72}$

$\frac{1}{2}V_{\odot} = 144\pi$

$V_{\square} = Bh$

$= \pi r^2 \cdot h$

$= \pi(6)^2 \cdot 6$

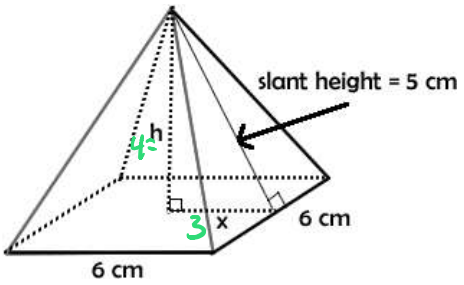
$= 36\pi \cdot 6$

$V_{\square} = 216\pi$

Volume – Pyramids & Spheres

G.GMD.A.3 Notes Section 17.3 Name_____

5.

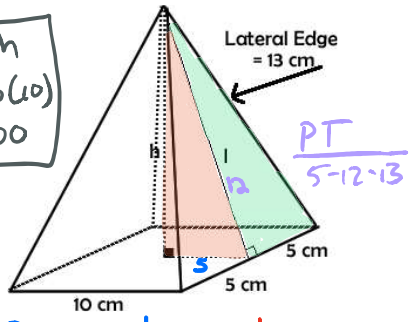


$B = bh$
$= 6(4)$
$B = 36$

PT
3-4-5

$V_{PYR} = \frac{1}{3}Bh$
$= \frac{1}{3}(36)(4)$
$= 12(4)$
$V_{PYR} = 48\ cm^3$

6.



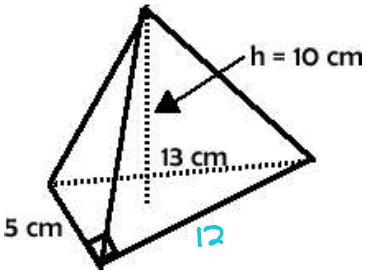
$B = bh$
$= 10(10)$
$B = 100$

PT
5-12-13

$x^2 + y^2 = r^2$
$(5)^2 + h^2 = (12)^2$
$25 + h^2 = 144$
$h^2 = 119$
$h = \pm\sqrt{119}$
$h = \sqrt{119}$

$V_{PYR} = \frac{1}{3}Bh$
$= \frac{1}{3}(100)\cdot\sqrt{119}$
$V_{PYR} = \frac{100}{3}\sqrt{119}\ cm^3$

7.

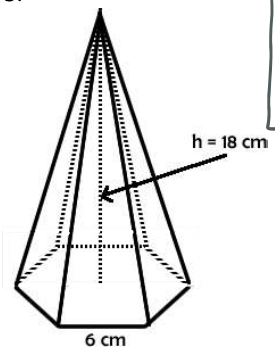


PT
5-12-13

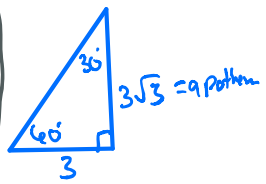
$B = \frac{1}{2}bh$
$= \frac{1}{2}(5)(12)$
$B = 30$

$V_{PYR} = \frac{1}{3}Bh$
$= \frac{1}{3}(30)\cdot 10$
$V_{PYR} = 100\ cm^3$

8.



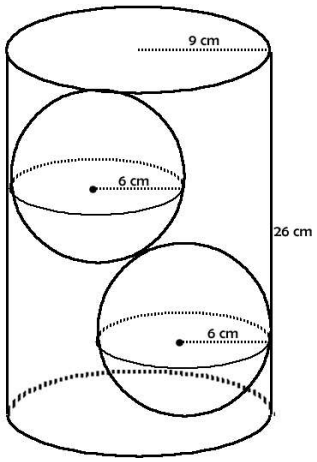
$m\angle C = \frac{360^\circ}{n}$
$= \frac{360}{6}$
$m\angle C = 60^\circ$



$B = \frac{1}{2}Pa$
$= \frac{1}{2}(36)(3\sqrt{3})$
$= 18(3\sqrt{3})$
$B = 54\sqrt{3}$

$V_{PYR} = \frac{1}{3}Bh$
$= \frac{1}{3}(54\sqrt{3})(18)$
$= (18\sqrt{3})(18)$
$V_{PYR} = 324\ cm^3$

9. Find Volume in the Can (not including the 2 tennis balls).



$V_{FIG} = V_{CYL} - 2V_{SPHERE}$
$= 2106\pi - 2(288\pi)$
$= 2106\pi - 576\pi$
$V_{FIG} = 1530\pi\ cm^3$

$V_{CYL} = B \cdot h$
$= \pi r^2 \cdot h$
$= \pi(9)^2 \cdot 26$
$= 81\pi \cdot 26$
$V_{CYL} = 2106\pi\ cm^3$

$V_{SPHERE} = \frac{4}{3}\pi r^3$
$= \frac{4}{3}\pi(6)^3$
$= \frac{4}{3}\pi(216)$
$V_{SPHERE} = 288\pi\ cm^3$