Integrated Math 2
Key Concept 6 REVIEW

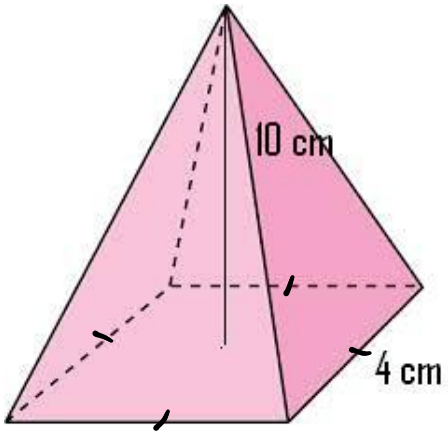
Name: Inked Copy
Period: _____

Target 6D: Calculate the base area and volume of prisms, cylinders, pyramids, and cones.

16. Calculate the volume of the square pyramid. $Volume = \frac{1}{3}(area\ of\ base) \cdot height\ of\ pyramid$ (1 point)

$V = \frac{1}{3} \cdot 4 \cdot 4 \cdot 10$

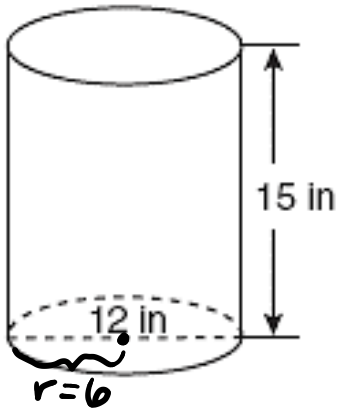
$V = 53.33\ cm^3$



17. Calculate the base area of the cylinder. $Area_{\odot} = \pi r^2$ (1 point)

$A = \pi \cdot 6^2$

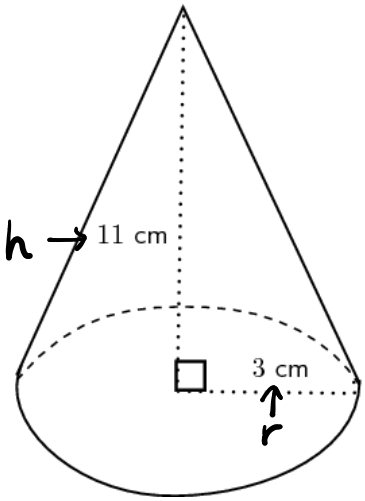
$A = 36\pi\ in^2$



18. Calculate the volume of the cone. $Volume = \frac{1}{3}(\pi r^2) \cdot height\ of\ cone$ (1 point)

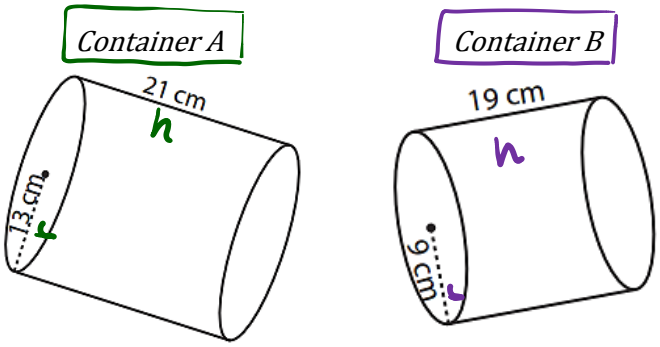
$V = \frac{1}{3} \cdot \pi \cdot 3^2 \cdot 11$

$= 33\pi\ cm^3$



19. Carrie has a choice of two different snack containers for her lunchbox. Both containers are the same price. Which container should Carrie buy if she wants more volume for her money? Explain. (3 points)

$Volume = \pi r^2 \cdot h$



$V_A = \pi \cdot 13^2 \cdot 21$

$= 3549\pi \text{ cm}^3$

$V_B = \pi \cdot 9^2 \cdot 19$

$= 1539\pi \text{ cm}^3$

Carrie should choose Container A b/c it will hold more snacks.

20. A cylindrical tube is removed from a prism. How much volume of the prism is left? Round your answer to the nearest hundredth. (3 points)

$Volume_{prism} = l \cdot w \cdot h$

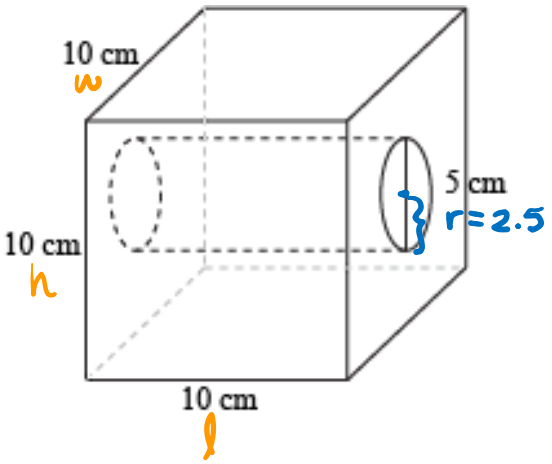
$Volume_{cylinder} = \pi r^2 \cdot h$

$V_{prism} = 10 \cdot 10 \cdot 10$

$= 1000 \text{ cm}^3$

$V_{cylinder} = \pi \cdot 2.5^2 \cdot 10$

$= 196.35 \text{ cm}^3$



$V = 1000 - 196.35$

$= \boxed{803.65 \text{ cm}^3}$

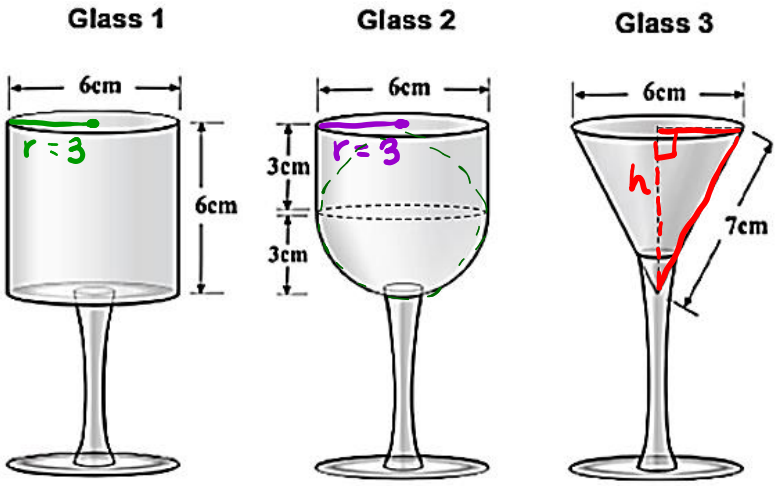
ADVANCED (10 possible points)

This diagram shows three glasses (not drawn to scale).

$Volume_{cylinder} = \pi r^2 \cdot h$

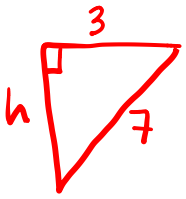
$Volume_{sphere} = \frac{4\pi r^3}{3}$

$Volume_{cone} = \frac{\pi r^2 h}{3}$



- The bowl of Glass 1 is cylindrical. The diameter is 6 cm and the height is 6 cm.
- The bowl of Glass 2 is a cylinder with a hemispherical bottom. The diameter is 6 cm and the height of the cylinder is 3 cm.
- The bowl of Glass 3 is an inverted cone. The diameter is 6 cm and the slant height is 7 cm.

1. Find the vertical height of the bowl of Glass 3. Show your work.



$3^2 + h^2 = 7^2$

$9 + h^2 = 49$

$-9 \quad -9$

$\sqrt{h^2} = \sqrt{40}$

$h = \sqrt{40}$ or 6.325

$\sqrt{40}$ or 6.325 cm

2. Calculate the volume of the bowl of each of these glasses. Show your work.

a) Glass 1 (cylinder)

$V = \pi r^2 h$

$= \pi \cdot 3^2 \cdot 6$

$= 54\pi = 169.65$

54π cm^3

b) Glass 2

141.37 cm^3

Cylinder part: $V = \pi r^2 h$

$= \pi \cdot 3^2 \cdot 3 = 27\pi \Rightarrow 84.82\ cm^3$

Hemisphere part: $V = \frac{4\pi r^3}{3}$

$= \frac{4\pi \cdot 3^3}{3} = 113.10 \div 2 = 56.55\ cm^3$ (take ½)

84.82
Total: +56.55
141.37 cm^3

c) Glass 3

59.61 cm^3

(cone)

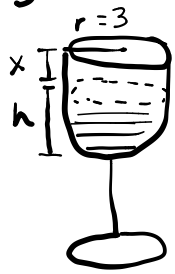
$V = \frac{\pi r^2 h}{3} = \frac{\pi \cdot 3^2 \cdot \sqrt{40}}{3} = 59.61\ cm^3$

3. Find the height of liquid in Glass 2 when it is half full. Show your calculations.

3.5 cm

Total V of Glass 2: 141.37

Half-full V of Glass 2: 70.685



$r^2 \pi h = 70.685$

$3^2 \pi x = 70.685$

$\frac{28.2743x}{28.2743} = \frac{70.685}{28.2743}$

$x = 2.4999 \approx 2.5$

$h_{filled} = h_{total} - h_{empty}$

$h = 6 - 2.5 = 3.5\ cm$