See next pages for work

Name: _____ **Date:** _____ **HW #56 Cones and Spheres**

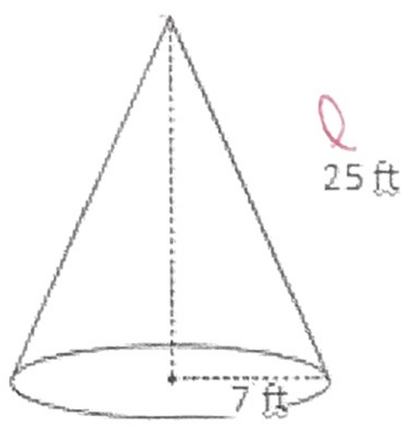
Give exact and approximate answers to the nearest hundredth unless told otherwise. **Do your work on a separate sheet of paper!**

1. A cone has a radius of 5 cm and a height of 2 cm. Find the amount it can hold.

$V = \frac{50\pi}{3}\ cm^3$

$V \approx 52.36\ cm^3$

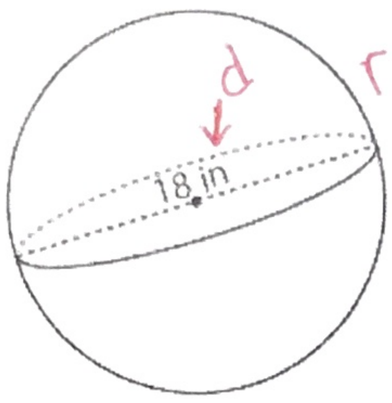
2.



Volume = $392\pi\ ft^3$

$\approx 1231.50\ ft^3$

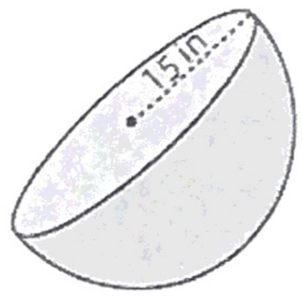
3)



Volume = $972\pi\ in^3$

$\approx 3053.63\ in^3$

4.



Volume = $225\pi\ in^3$

$\approx 7068.58\ in^3$

5. The formula for volume of a cylinder is $V = \pi r^2 h$. Solve for h.

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

6. The formula for volume of a sphere is $V = \frac{4\pi r^3}{3}$. Solve for r.

$r = \sqrt[3]{\frac{3V}{4\pi}}$

7. The volume for a cone is $V = \frac{\pi r^2 h}{3}$. Solve for h.

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

8. Find the **approximate** radius of a cone with a volume of 175 cm^3 and a height of 21 cm.

$r \approx$ 2.82 cm

9. A round balloon was filled with 300 cubic inches of helium. What is the radius of the inflated balloon? (Assume the inflated balloon is a perfect sphere.)

$r = \sqrt[3]{\frac{225}{\pi}}$ in

$r \approx$ 4.15 in

10 . Rocky Middle School plans to sell ice cream as a fundraiser. They expect to sell about 200 scoops of ice cream. The ice cream comes in cylindrical cartons. Ester's committee must decide how many cartons to buy for the event.

- A carton of ice cream has a radius of 11 centimeters and a height of 30 centimeters.
- A scoop of ice cream has a radius of 3 centimeters.

How many cartons of ice cream should Ester order to make 200 scoops?

need $7200\pi\ cm^3$

$V_{sp} = \frac{4\pi r^3}{3} \cdot 200$

$= \frac{800\pi(3)^3}{3^1}$

$= 800\pi 3^2$

$= 800\pi(9)$

$= 7200\pi cm^3$

1 cartoon has $3630\pi\ cm^3$

$V_{cyl} = \pi r^2 h$

$= \pi(11)^2(30)$

$= \pi(121)(30)$

$= 3630\pi$

Need to Buy $\frac{7200\pi\ cm^3}{3630\pi\ cm^3}$

≈ 1.98 containers

So buy 2 containers

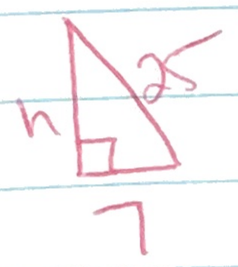
(1) $V_{co} = \frac{\pi r^2 h}{3}$

$V_{co} = \frac{\pi (5)^2 (2)}{3}$

$V_{co} = \frac{\pi (25)(2)}{3}$

$\boxed{V_{co} = \frac{50\pi}{3} \text{ cm}^3}$

(2) $V_{co} = \frac{\pi r^2 h}{3}$



$7^2 + h^2 = 25^2$

$49 + h^2 = 625$

$-49 \quad -49$

$\sqrt{h^2} = \sqrt{576}$

$h = 24$

$V_{co} = \frac{\pi (7)^2 (24)}{3}$

$V_{co} = \pi (49) \cdot 8$

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

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

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

$= \frac{4\pi 729}{3}$

$= \frac{2916\pi}{3}$

$\boxed{= 972\pi \text{ in}^3}$

(4) $V_{sp} = \frac{4\pi r^3}{3} \cdot \frac{1}{2}$ (it's ½ a sphere)

$= \frac{4\pi (15)^3}{6}$

$= \frac{4\pi 3375}{6}$

$= \frac{13500\pi}{6}$

$\boxed{= 2250\pi \text{ in}^3}$

(5) $\frac{V}{\pi r^2} = \frac{\pi r^2 h}{\pi r^2}$

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

(6) $\frac{1}{3} \cdot V = \frac{4\pi r^3}{3} \cdot 3$

$3V = 4\pi r^3$

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

$\sqrt[3]{\frac{3V}{4\pi}} = \sqrt[3]{r^3}$

$r = \sqrt[3]{\frac{3V}{4\pi}}$

(7) $\frac{1}{3} \cdot V = \frac{\pi r^2 h}{3} \cdot 3$

$3V = \pi r^2 h$

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

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

(8) $V_{co} = \frac{\pi r^2 h}{3}$

$175 = \frac{\pi r^2 (21)}{3}$

$\frac{175}{(7\pi)} = \frac{\pi r^2 \cdot 7}{7\pi}$

$\sqrt{7.96} \approx \sqrt{r^2}$

$r \approx 2.82 cm$

(9) $V_{sp} = \frac{4\pi r^3}{3}$

$\frac{3}{4} \cdot 300 = \frac{4\pi r^3}{3} \cdot \frac{3}{4}$

$\frac{225}{\pi} = \frac{\pi r^3}{\pi}$

$\sqrt[3]{\frac{225}{\pi}} = \sqrt[3]{r^3}$

$r = \sqrt[3]{\frac{225}{\pi}}$