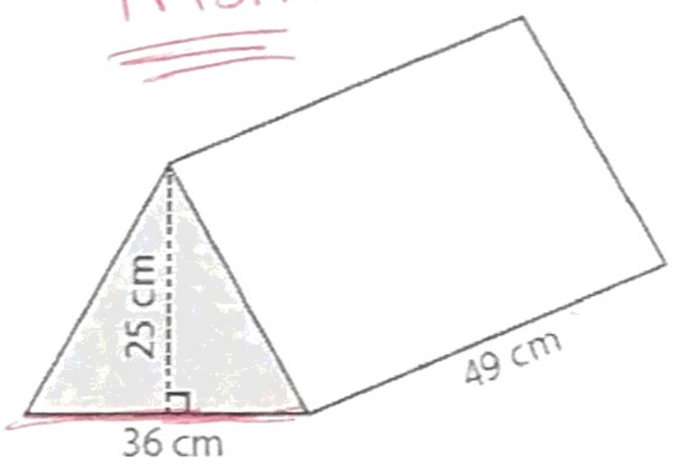
See next pages for work

Name: _____ **Date:** _____ **HW #55 Volume**

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

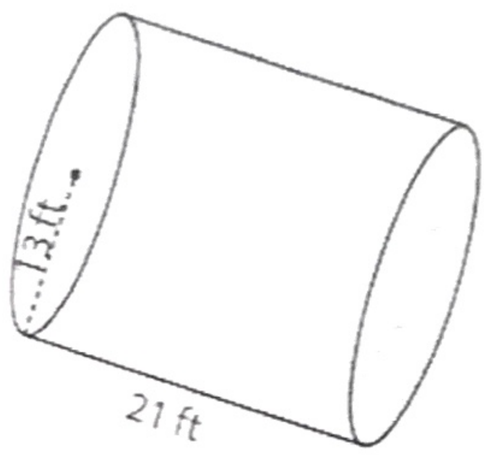
For 1 – 3, find the desired dimension of each shape.

1) Triangular Prism



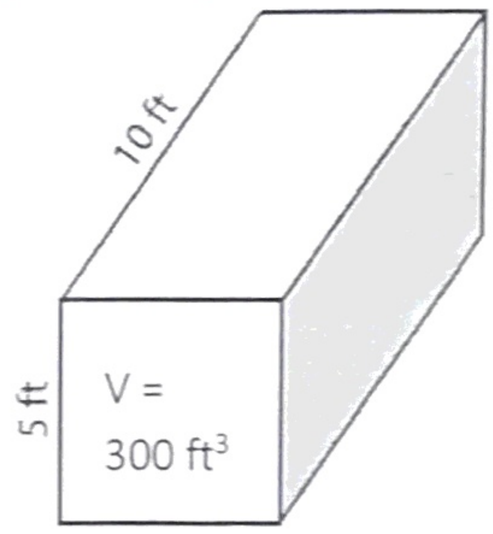
Volume = 22050 cm³

2) cylinder



Volume = 3549π ft³ ≈ 11149.51 ft³

3) Rect. prism



Length = 6 ft

4. A soup can holds 36 cubic inches. It has a radius of 4 inches. Find the height of the soup can.

Exact height = $\frac{9}{4\pi}$ in

Height ≈ 0.72 in

5. The formula for volume of a rectangular solid is $v = lwh$. Solve for h.

h = $\frac{V}{lw}$

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

r = $\sqrt{\frac{V}{\pi h}}$

7. A 70 foot tall building has a length of 100 feet. If the amount of air inside the building is 525,000 cubic feet, what is the building's width?

W = 75 ft.

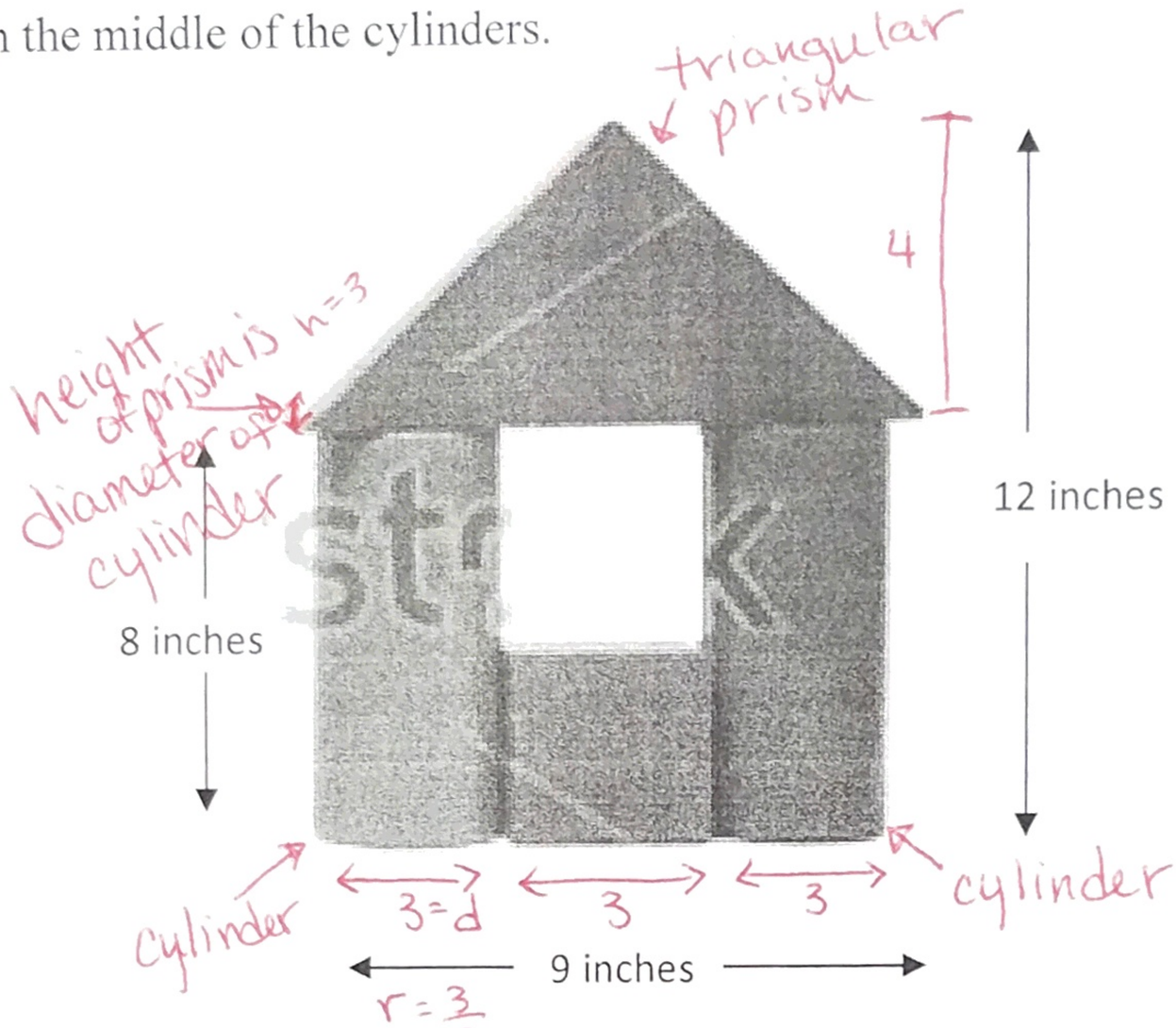
8. Jorge made a cube structure using 13,824 cubes. How long is the side of his structure?

S = 24 cubes long

9. Find the **approximate** (nearest tenth) radius of a cylinder with a height of 12 inches and volume of 600 cubic inches.

r ≈ 4.0 inches

10. Find the **exact** volume of the block structure below. The diameter of each cylinder is equal to the length of the cube in the middle of the cylinders.



2 cylinders

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

$V = \pi(1.5)^2 \cdot 8 \cdot 2$

$V = \pi(2.25)(16)$

$V = 36\pi \text{ in}^3$

Cube $V = s^3$

$V = 3^3$

$V = 27 \text{ in}^3$

triangular prism

$V = Bh$

$V = 18 \cdot 3$

$V = 54 \text{ in}^3$

B = area of the s

$B = \frac{bh}{2}$

$= \frac{9 \cdot 4}{2}$

$= \frac{36}{2}$

$= 18$

V = $81 + 36\pi$ in^3

Volume of structure (sum all parts)

$27 + 54 + 36\pi$

$81 + 36\pi$

① $V = Bh$

$V = 450 \cdot 49$

$\boxed{V = 22{,}050\ cm^3}$

B area of the base (Δ) $= \frac{bh}{2}$

$= \frac{36 \cdot 25}{2}$

$B = 450$

② $V = \pi r^2 h$

$V = \pi (13)^2 \cdot 21$

$\boxed{V = 3549\pi\ ft^3}$ $\boxed{\approx 11149.51\ ft^3}$

③ $V = lwh$

$300 = l \cdot 10 \cdot 5$

$\frac{300}{50} = \frac{50l}{50}$

$6 = l$ $\boxed{l = 6\ ft}$

④ $V = \pi r^2 h$

$36 = \pi 4^2 \cdot h$

$\frac{36}{16\pi} = \frac{16\pi \cdot h}{16\pi}$

$h = \frac{36}{16\pi} \div \frac{4}{4}$ $\boxed{h = \frac{9}{4\pi}\ in}$ $\approx 0.72\ in$

(5) $V = lwh$

$$\frac{V}{lw} = \frac{lwh}{lw}$$

$$\boxed{h = \frac{V}{lw}}$$

(6) $V = \pi r^2 h$

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

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

$$\boxed{r = \sqrt{\frac{V}{\pi h}}}$$

(7) $V = lwh$

$525000 = 100 \cdot w \cdot 70$

$$\frac{525000}{7000} = \frac{7000w}{7000}$$

$$\boxed{75 \text{ ft} = w}$$

(8) $V = s^3$

$\sqrt[3]{138824} = \sqrt[3]{s^3}$

$$\boxed{24 = s}$$

(9) $V = \pi r^2 h$

$$\frac{600}{12\pi} = \frac{\pi r^2 \cdot 12}{12\pi}$$

$\sqrt{15.9} \approx \sqrt{r^2}$

$$\boxed{4.0 \approx r \text{ inches}}$$