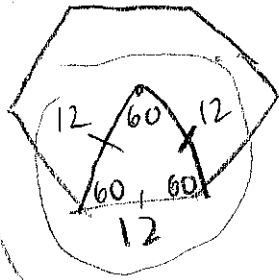
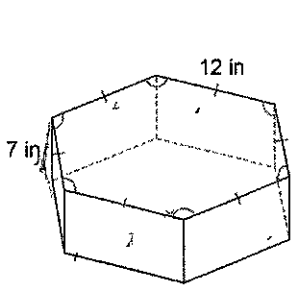


Turn the Volume to Eleven

Find the surface area & volume of the following figures.

1.



$$\frac{360}{6} = 60$$

$$A_{\Delta} = \frac{1}{2} \cdot 12 \cdot 12 \cdot \sin 60$$

One Δ

$$= \frac{1}{2} \cdot 12 \cdot 12 \cdot \sin 60 = 62.35 \text{ in}^2$$

x
6

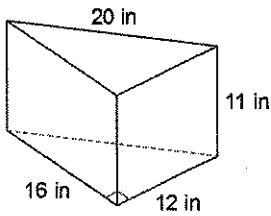
$$\text{Area of base} = 374.12 \text{ in}^2$$

Hexagon

$$SA = \underbrace{2(374.12)}_{2 \text{ bases}} + \underbrace{6(7 \cdot 12)}_{6 \text{ rect.}}$$

Surface Area = 1252.25 in^2 Volume = $374.12 \text{ in}^2 \cdot 7 \text{ in} = 2618.86 \text{ in}^3$

2.

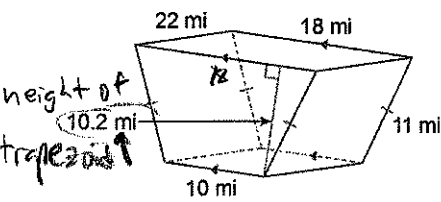


$$\text{Area of base} = \frac{16 \cdot 12}{2} = 96 \text{ in}^2$$

$$SA = \underbrace{2(96)}_{2 \text{ bases}} + \underbrace{11 \cdot 12 + 16 \cdot 11 + 20 \cdot 11}_{3 \text{ rectangles}}$$

Surface Area = 720 in^2 Volume = $96 \text{ in}^2 \cdot 11 \text{ in} = 1056 \text{ in}^3$

3.



$$\text{Area of base} = \frac{(18+10) \cdot 10.2}{2} = 142.8 \text{ mi}^2$$

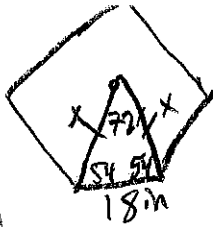
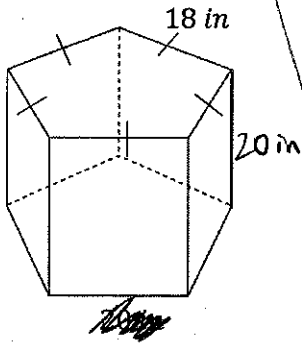
trapezoid

$$SA = \underbrace{2(142.8)}_{2 \text{ bases}} + \underbrace{2(22 \cdot 11) + 22 \cdot 18 + 22 \cdot 10}_{2 \text{ rect. and 2 other rect.}}$$

Surface Area = 1385.6 mi^2 Volume = $142.8 \text{ mi}^2 \cdot 22 \text{ mi} = 3141.6 \text{ mi}^3$

length between the bases

4.



$$\frac{360}{5} = 72$$

$$\frac{\sin 72}{18} = \frac{\sin 54}{x} \rightarrow x = 15.31 \text{ in}$$

$$A_{\Delta} = \frac{1}{2} \cdot 15.31 \cdot 15.31 \cdot \sin 72 = 111.49 \text{ in}^2$$

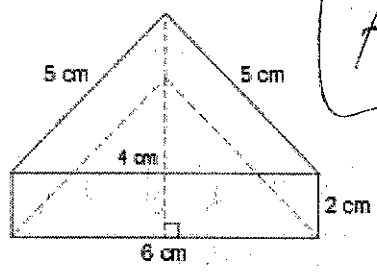
$$\text{Area of base} = 557.43 \text{ in}^2$$

$$SA = 2(557.43) + 5(18 \cdot 20)$$

2 bases 5 ≅ rect.

Surface Area = 2914.87 in² Volume = 557.43 in² · 20 in = 11148.69 in³

5.



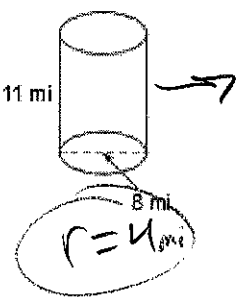
$$\text{Area of base} = \frac{4 \cdot 6}{2} = 12 \text{ cm}^2$$

$$SA = 2(12) + 6 \cdot 2 + 2(5 \cdot 2)$$

2 bases rect. and 2 ≅ rect

Surface Area = 56 cm² Volume = 12 cm² · 2 cm = 24 cm³

6.



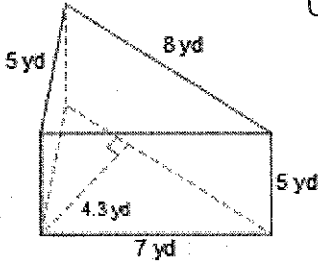
$$\text{Area of base} = \pi \cdot 4^2 = 50.27 \text{ mi}^2$$

$$SA = 2(50.27) + 2\pi \cdot 4 \cdot 11$$

2 bases Dimensions of rect

Surface Area = 376.99 mi² Volume = 50.27 mi² · 11 mi = 552.92 mi³

7.



$$\text{Area of base} = \frac{8 \cdot 4.3}{2} = 17.2 \text{ yd}^2$$

$$SA = \underbrace{2(17.2)}_{2 \text{ bases}} + \underbrace{8 \cdot 5 + 7 \cdot 5 + 5 \cdot 5}_{3 \text{ rectangles}}$$

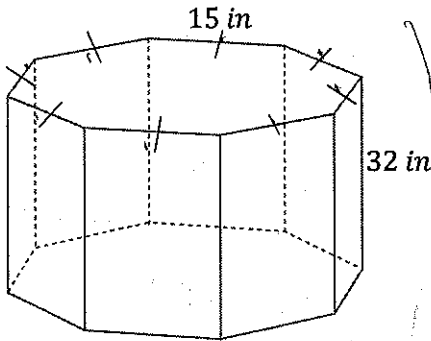
Surface Area =

$$134.4 \text{ yd}^2$$

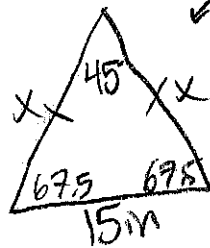
Volume =

$$17.2 \text{ yd}^2 \cdot 5 \text{ yd} = \boxed{86 \text{ yd}^3}$$

8.



ONE of 8 Δ's



$$\frac{360}{8} = 45^\circ$$

$$\frac{\sin 45}{15} = \frac{\sin 67.5}{x}$$

$$x \approx 19.6 \text{ in}$$

ONE Δ

$$SA = \underbrace{2(1096.4)}_{2 \text{ bases}} + \underbrace{8(15 \cdot 32)}_{8 \text{ rect.}}$$

$$A_{\Delta} = \frac{1}{2} \cdot 19.6 \cdot 19.6 \cdot \sin 45 = 135.8 \text{ in}^2$$

$$\text{Area of base} = \frac{x}{8} = 1096.4 \text{ in}^2$$

Surface Area =

$$6012.79 \text{ in}^2$$

Volume =

$$1096.4 \text{ in}^2 \cdot 32 \text{ in} = \boxed{34764.68 \text{ in}^3}$$

