Review of Area and Volume with Tips     Master Ey

**1-3: Find the Volume of each shape described.**

1. A soup can is 4 inches in diameter and 6 inches high. Express your answer in terms of $\pi$.

$$\pi(2)^2(6) = \boxed{24\pi \text{ in}}$$
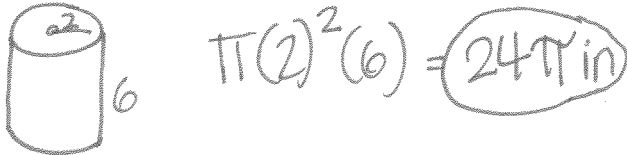
2. A square pyramid has a base area of 81 in$^2$ and a height of 10 in.

$$\frac{1}{3} \cdot 81 \cdot 10 = \boxed{270 \text{ in}^3}$$
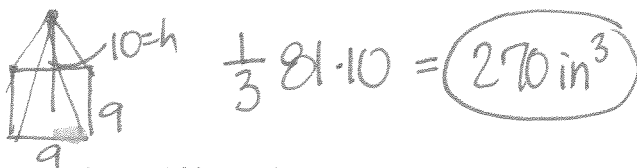
3. A square Pyramid has a height of 5 inches and 7 inch base edges.

$$\frac{1}{3} \cdot 49 \cdot 5 = \boxed{81.67 \text{ in}^3}$$
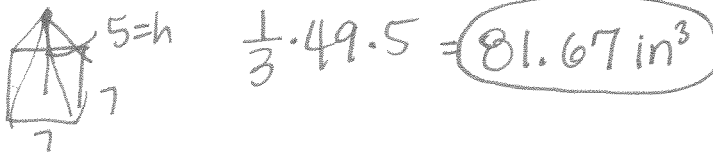
**4-5: Find the radius of each shape described.**

4. A beach ball whose surface area is $100\pi \text{ ft}^2$

$$SA = \frac{100\pi}{4\pi} = \frac{4\pi r^2}{4\pi} \qquad r^2 = 25 \qquad \boxed{r = 5 \text{ ft}}$$

5. A cone with a volume of $80\pi$ and a height of 15 ft.

$$V = 80\pi = \frac{1}{3}\pi r^2 (15) \qquad \frac{80\pi}{5\pi} = \frac{5\pi r^2}{5\pi} \qquad r^2 = 16 \qquad \boxed{r = 4 \text{ ft}}$$

**6-7: Find the area of each triangle.**

6.

$$h^2 + 12^2 = 13^2$$
$$h^2 = 25$$
$$h = 5$$

13 m
h
12 m

$$A = \frac{1}{2} \cdot 5 \cdot 12$$
$$\boxed{A = 30 \text{ m}^2}$$

7.

14 cm
30°
$7\sqrt{3}$

$$A = \frac{1}{2} \cdot 7 \cdot 7\sqrt{3}$$
$$\boxed{A = 42.44 \text{ cm}^2}$$
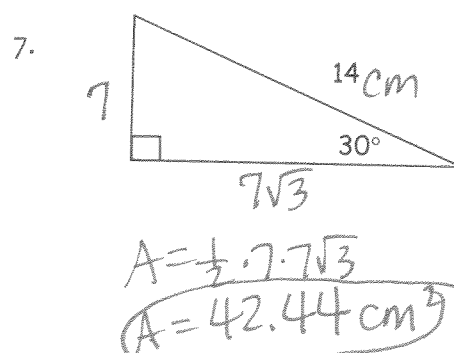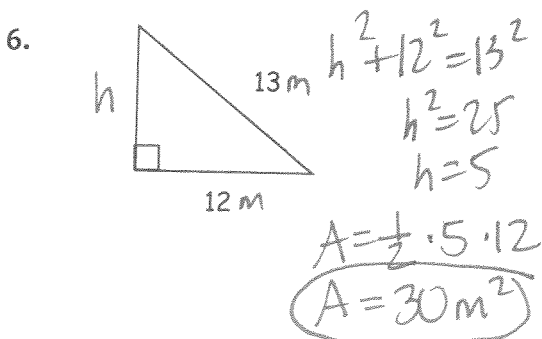
**8-10: Find the height of each shape.**

8.

6 cm

h

4

8 cm

$4^2+h^2=6^2$

$h^2=20$

$h=\sqrt{20}$

or $h=2\sqrt{5}$ cm

or $h\approx 4.47$ cm

9.

h

15 cm

11 cm
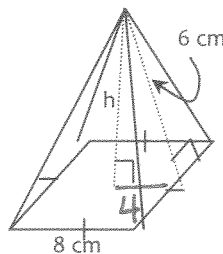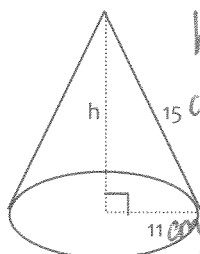
$h^2+11^2=15^2$

$h^2=104$

$h=\sqrt{104}$

$h=2\sqrt{26}$ cm

or $h\approx 10.20$ cm

10.

h

$6\sqrt{3}$

12 in

60°

6
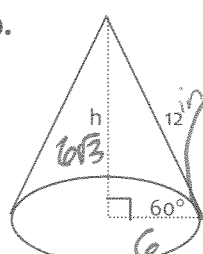
$h=6\sqrt{3}$ in

$h\approx 10.39$ in

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**Tip #3:** Sometimes you will have to take the square root or cube root in order to simplify a formula so you can find a part when given the final answer. Use the MATH button, then #4 for cube roots.

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**11-12: Solve each problem based on your knowledge of a cube.**

11. A cube has a volume of 4913 in³. What is the length of one side?

$s^3=4913$     $\sqrt[3]{s^3}=\sqrt[3]{4913}$     $s=17$ in

12. What is the surface area of the cube in #11?

$SA=hp+2B=17\cdot(17\cdot4)+2(17\cdot17)=1734$ in²

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**Tip #4:** When comparing two similar solids, the volume of the larger one is (SF)³ bigger!

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**13-14: Solve each problem based on your knowledge of similar solids.**

13. A small beach ball has a volume of 17 in³. A large beach ball has a radius that is twice as big. What is its volume?
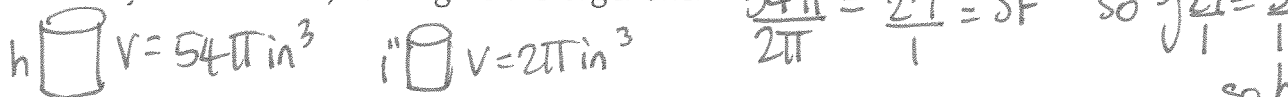
$V=17$ in³     $2r$

$SF=1:2$

$VSF=1^3:2^3=1:8$

$8(17\text{ in}^3)=136$ in³

14. A cylinder has a volume of 54π in³. A smaller cylinder has a volume of 2π in³. If the height of the smaller cylinder is 1 inch, how high is the larger one?

h $V=54\pi$ in³     1" $V=2\pi$ in³

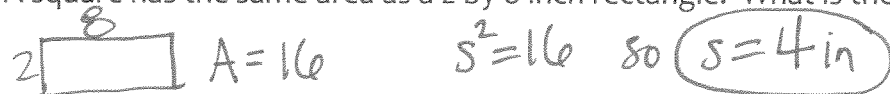$\dfrac{54\pi}{2\pi}=\dfrac{27}{1}=SF^3$ So $\sqrt[3]{\dfrac{27}{1}}=\dfrac{3}{1}$

so height = 3 in.

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**Tip #5:** Sometimes you have to solve one figure to get information to solve a second one!

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**15-16: Find the side of each shape based on the given information.**

15. A square has the same area as a 2 by 8 inch rectangle. What is the length of a side of the square?

8
2

$A=16$     $s^2=16$ so $s=4$ in

16. A cube has the same volume as a 2 by 8 by 4 inch box. What is the length of a side of the cube?

4
2   8

$V=2\cdot8\cdot4$
$V=64$

$s^3=64$
$s=\sqrt[3]{64}$
$s=4$ in