

For #1 find the surface area, volume and reduced surface area to volume ratio.

1. A rectangular prism with dimensions of 15cm by 15cm by 11cm.

$$SA = 1110 \quad V = 2475 \quad \text{Ratio} = \frac{1110}{2475} = \frac{74}{165}$$

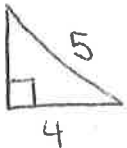
$$2(15)(15) + 2(15)(11) + 2(15)(11)$$

For #2 find the lateral area, surface area, and volume of the prism.

2. A triangular prism where the base is a **right triangle** with one leg that is 4cm and a hypotenuse is 5cm. The **height of the prism** is 17cm.

		ph	L+2B	Bh
p = 12	B = 6	L = 204	SA = 216	V = 102

Picture of the base:



(p) perimeter of base: _____

(B) area of the base: _____

$$a^2 + 4^2 = 5^2$$

$$a = 3$$

$$p = 3 + 4 + 5$$

$$B = \frac{1}{2}(3)(4)$$

(L) lateral area: _____

(SA) surface area: _____

(V) volume: _____

$$(12)(17)$$

$$204 + 2(6)$$

$$(6)(17)$$

3. Find the lateral area, surface area, and volume for a pyramid whose base is a regular septagon with sides of 12 in and an apothem of 12.46 in. The height of the pyramid is 23 in.

Lateral Area = 1098.72

Surface Area = 1622.04

Volume = 4012.12

$$L = \frac{1}{2} l (\# \text{ of base sides}) \cdot b$$

$$= \frac{1}{2} (26.16) (7) (12)$$

$$B = \frac{1}{2} ap$$

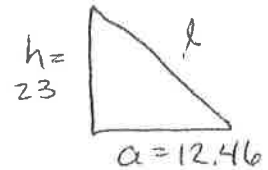
$$= \frac{1}{2} (12.46) (7)(12)$$

$$= 523.32$$

$$V = \frac{1}{3} Bh$$

$$= \frac{1}{3} (523.32) (23)$$

SA = 1098.72 + 523.32



$$23^2 + 12.46^2 = l^2$$

$$529 + 155.25 = l^2$$

$$684.25 = l^2$$

$$26.16 = l$$

For the following questions, write the letter or words of the correct answer on the line.

D 4. The segment that connects the center of the bases of a cylinder is called:
 a. Altitude b. Base height c. Slant Height d. Axis

C 5. The segment that connects the vertex to the outside of the base in a cone is called:
 a. Altitude b. Base height c. Slant Height d. Axis

~~Answer~~ D 6. In order to find lateral area, you must first find:
 a. Volume b. Area of the base c. Surface Area d. Slant height

7. The difference between lateral area and surface area is SA includes base.

8. Find the surface area and volume for a sphere where the radius is 30cm.

$$SA = \underline{3600\pi} \quad V = \underline{36000\pi}$$

$$= 4\pi r^2 \quad = \frac{4}{3}\pi r^3$$

$$= 4\pi (30)^2 \quad = \frac{4}{3}\pi (30)^3$$

9. Find the surface area and volume of cone whose base has a diameter of 8 in. The height of the cone is 16 in.

Surface Area = 81.96π

Volume = 85.33π

$$V = \frac{1}{3}\pi r^2 h$$

$$= \frac{1}{3}\pi (4)^2 (16)$$

$$= \frac{256}{3}\pi$$

$$SA = \pi r^2 + \pi r \sqrt{r^2 + h^2}$$

$$= \pi (4)^2 + \pi (4) \sqrt{(4)^2 + (16)^2}$$

$$= 16\pi + 4\pi \sqrt{272}$$

$$= 16\pi + 4\pi (16.49)$$

$$= 16\pi + 65.96\pi$$

10. Find the surface area and volume of a cylinder with a base whose radius is 13 in and the height of the cylinder is 34 in.

Surface Area = 1222π

Volume = 5746π

$$SA = 2\pi r^2 + 2\pi rh$$

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

$$SA = 2\pi(13)^2 + 2\pi(13)(34)$$

$$V = \pi(13)^2(34)$$

$$SA = 2\pi(169) + 2\pi(442)$$

$$V = \pi(169)(34)$$

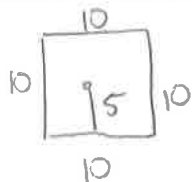
$$SA = 338\pi + 884\pi$$

$$V = 5746\pi$$

$$SA = 1222\pi$$

11. Use the pyramid with a square base. The area of the base is 100cm^2 and the volume of the pyramid is 400cm^3 .

Picture of the base:



(s) side length: 10

(h) height of the pyramid: 12

$$B = s^2$$

$$\sqrt{100 = s^2} \quad s = 10$$

$$V = \frac{1}{3} Bh$$

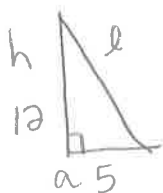
$$400 = \frac{1}{3}(100)h$$

(p) Perimeter of the base: 40

(l) slant height: 13

(a) apothem: 5

(L) Lateral Area of the pyramid: 260



$$5^2 + 12^2 = l^2$$

$$L = \frac{1}{2}(4)(10)(13)$$

$$25 + 144 = l^2$$

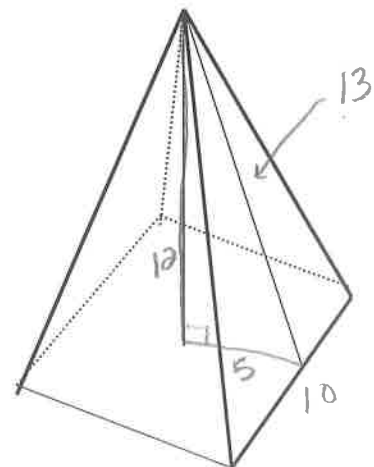
$$\sqrt{169} = l^2$$

$$13 = l$$

(SA) Surface Area of the pyramid: 360

$$SA = L + B$$

$$= 260 + 100$$



order of steps is ①②③④

12. What is the area of the base of an octagonal prism whose base edge is 3ft, lateral area is 441.6 ft^2 , and volume is 2807.84 ft^3 ?

$p = \# \text{ of sides} \cdot b$
 $p = 8 \cdot 3$
 $p = 24$

$B = \frac{1}{2}ap$
 $L = ph$
 $441.6 = 24h$
 $\frac{441.6}{24} = \frac{24h}{24}$
 $18.4 = h$

$SA = L + 2B$

$V = Bh$

$2807.84 = B(18.4)$
 $\frac{2807.84}{18.4} = \frac{B(18.4)}{18.4}$
 $152.6 = B$

$B = ?$
 $\# \text{ of sides} = 8$
 $b = 3$
 $L = 441.6$
 $V = 2807.84$

13. What is the slant height of an 11-gon pyramid whose surface area is 450.86195 in^2 , apothem is 2.1 in, and base edge is 6.47 in?

$l = ?$
 $\# \text{ of sides} = 11$
 $SA = 450.86195$
 $a = 2.1$
 $b = 6.47$

$p = \# \text{ of sides} \cdot b$
 $p = 11 \cdot 6.47$
 $p = 71.17$

$B = \frac{1}{2}ap$
 $B = \frac{1}{2}(2.1)(71.17)$
 $B = 74.7285$

$L = \frac{1}{2}(\# \text{ of sides})b l$
 $SA = L + B$
 $V = \frac{1}{3}Bh$
 $450.86195 = L + 74.7285$
 $\frac{450.86195}{-74.7285} = \frac{L + 74.7285}{-74.7285}$
 $376.1335 = L$

$376.1335 = \frac{1}{2}(11)(6.47)l$

$376.1335 = 35.585l$
 $\frac{376.1335}{35.585} = \frac{35.585l}{35.585}$

$10.57 = l$

14. What is the volume of a rectangular prism whose surface area to volume ratio is $\frac{128}{483}$ and whose surface area is 464?

$\frac{SA}{Vol} = \frac{128}{483}$
 $SA = 464$

$\frac{128}{483} = \frac{464}{?}$

$(483)(464) = 128x$

$\frac{224112}{128} = \frac{128x}{128}$

$1750.875 = x$