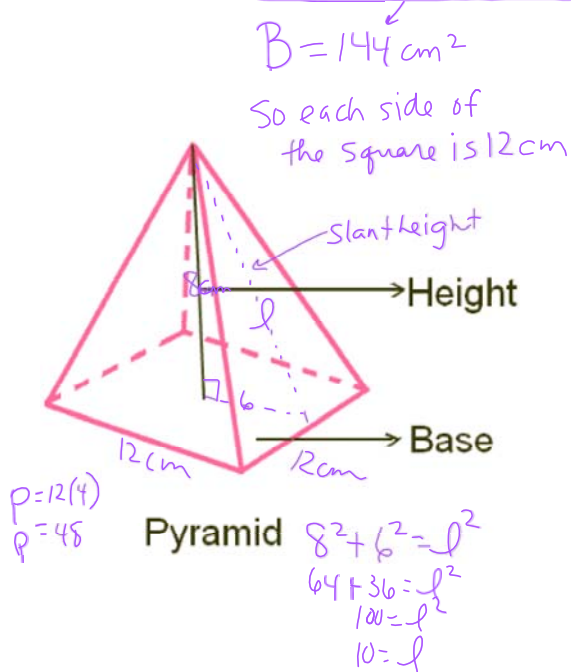


Notes for volume and surface area of a pyramid.

**Example 1:** Find the volume and surface area of a square-based pyramid with a base area of  $144 \text{ cm}^2$  and a height of  $8 \text{ cm}$ .



$l =$  slant height

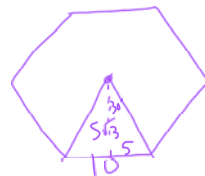
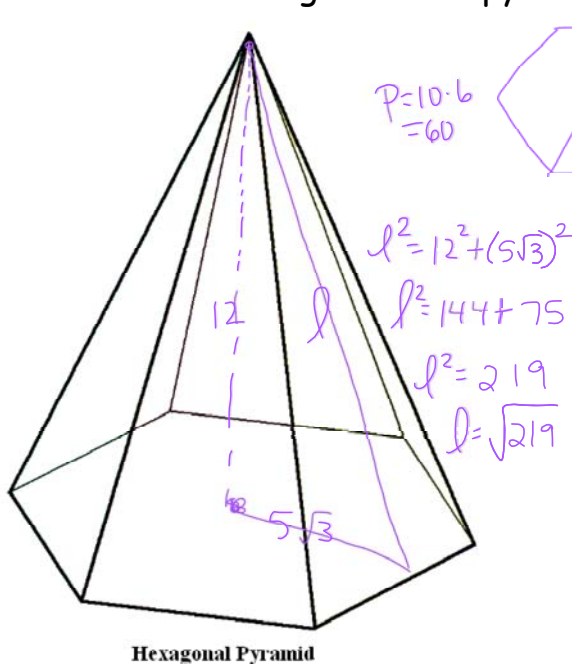
$$B = 144 \text{ cm}^2$$

$$LA = \frac{1}{2}pl = \frac{1}{2}(48)(10) = 240 \text{ cm}^2$$

$$V = \frac{1}{3}B \cdot h = \frac{1}{3}(144)(8) = 384 \text{ cm}^3$$

$$SA = B + LA = 144 + 240 = 384 \text{ cm}^2$$

**Example 2:** Find the volume and surface area of a regular hexagonal-based pyramid with a side of  $10 \text{ cm}$  for the hexagon and  $12 \text{ cm}$  for the height of the pyramid.



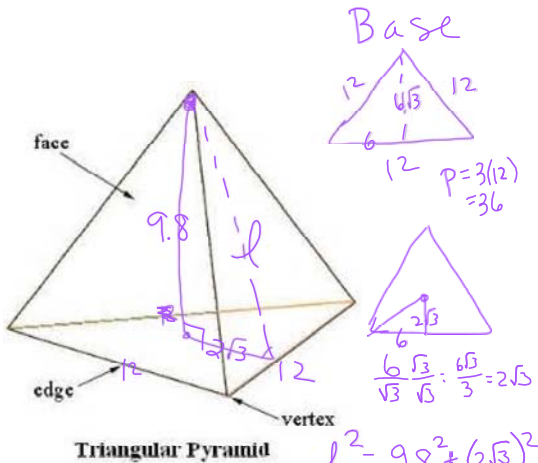
$$B = \frac{1}{2}(10)(5\sqrt{3}) \cdot 6 = 150\sqrt{3} \text{ cm}^2 \approx 259.8 \text{ cm}^2$$

$$LA = \frac{1}{2}pl = \frac{1}{2}(60)\sqrt{219} = 30\sqrt{219} \approx 444.0 \text{ cm}^2$$

$$V = \frac{1}{3}Bh = \frac{1}{3}(150\sqrt{3})(12) \approx 1039.2 \text{ cm}^3$$

$$SA = B + LA = 150\sqrt{3} + 30\sqrt{219} \approx 703.8 \text{ cm}^2$$

**Example 3:** Find the volume and surface area of a regular triangular-based pyramid with a side of 12 inches for the triangle and 9.8 cm for the height of the pyramid.



$$B = \frac{1}{2}bh = \frac{1}{2}(12)(6\sqrt{3}) = 36\sqrt{3} \text{ in}^2$$

$$LA = \frac{1}{2}pl = \frac{1}{2}(36)\sqrt{108.04} = 18\sqrt{108.04} \approx 187.1 \text{ in}^2$$

$$V = \frac{1}{3}Bh = \frac{1}{3}(36\sqrt{3})(9.8) \approx 203.7 \text{ in}^3$$

$$SA = B + LA = 36\sqrt{3} + 18\sqrt{108.04} \approx 249.4 \text{ in}^2$$