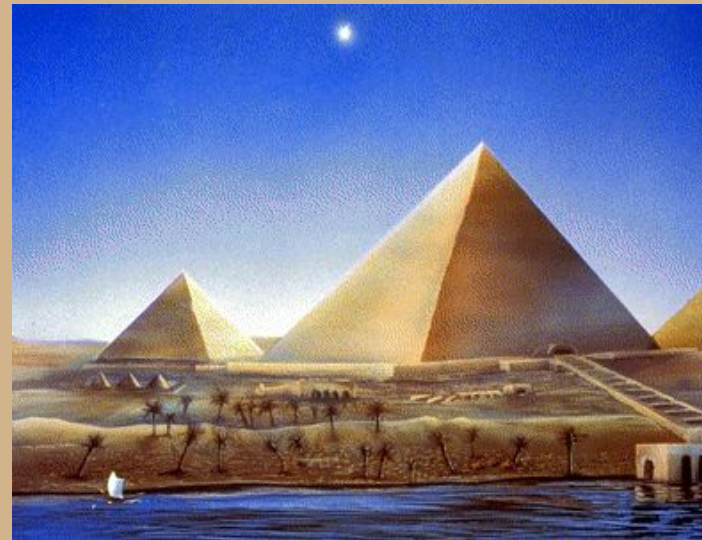
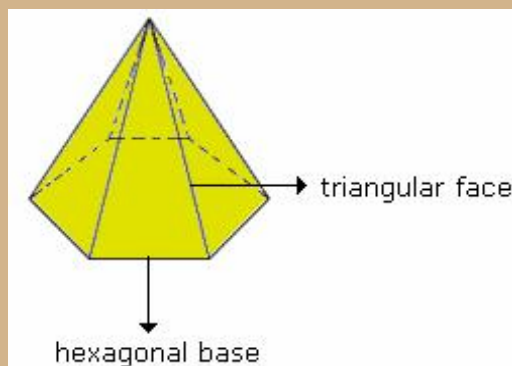
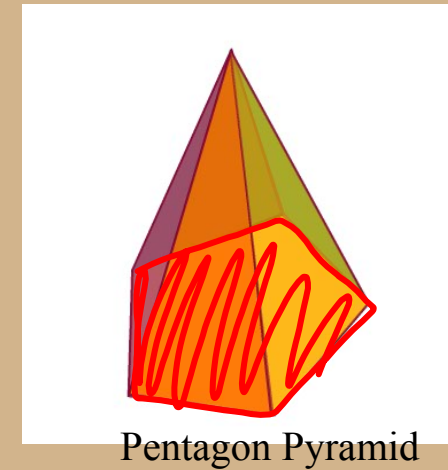
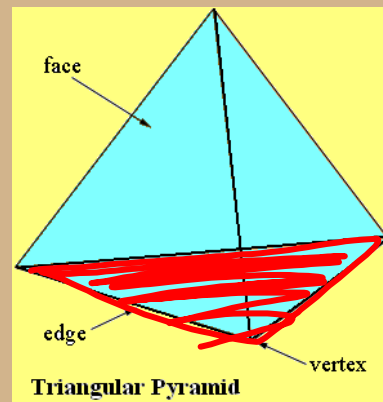
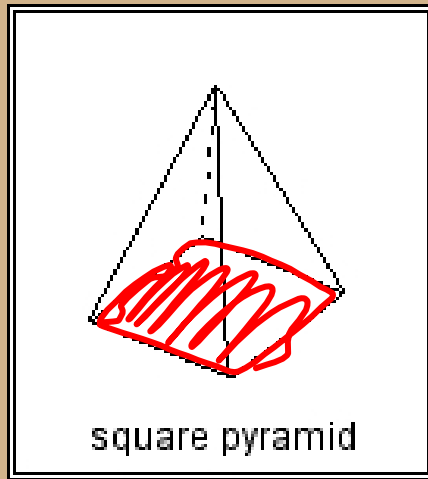


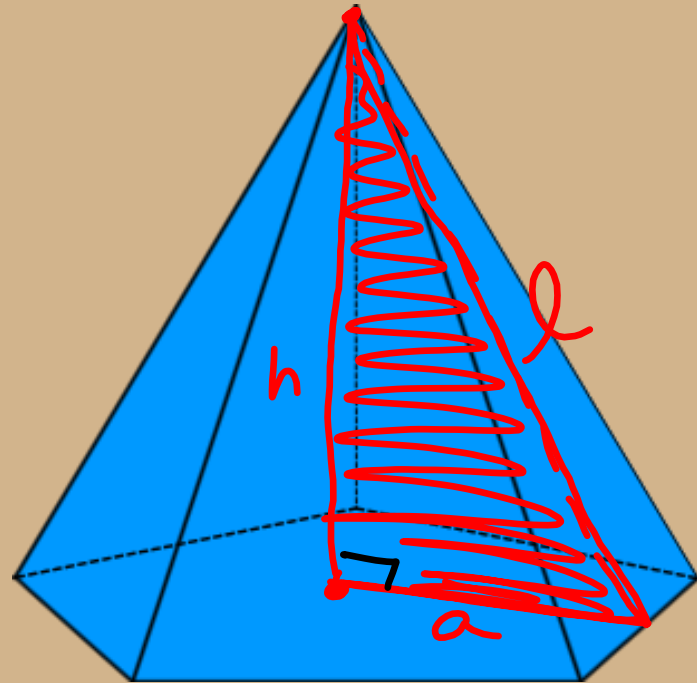
Geometry

Ch. 11 Handout 11.3

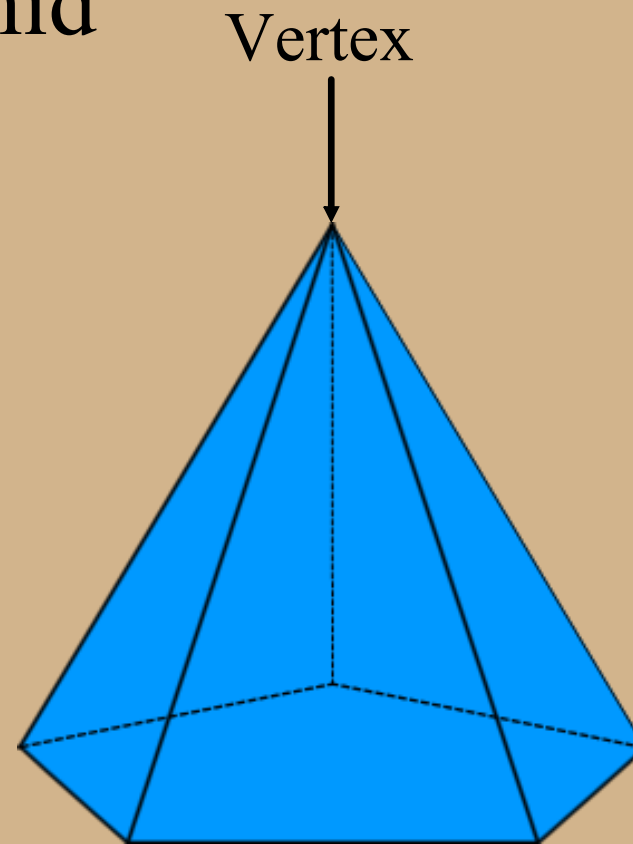
Surface Areas of Pyramids

A **pyramid** is a polyhedron in which one face (the **base**) can be any polygon and the other faces (the **lateral faces**) are triangles that meet at a common vertex (called the **vertex** of the pyramid). You name a pyramid by the shape of the base.

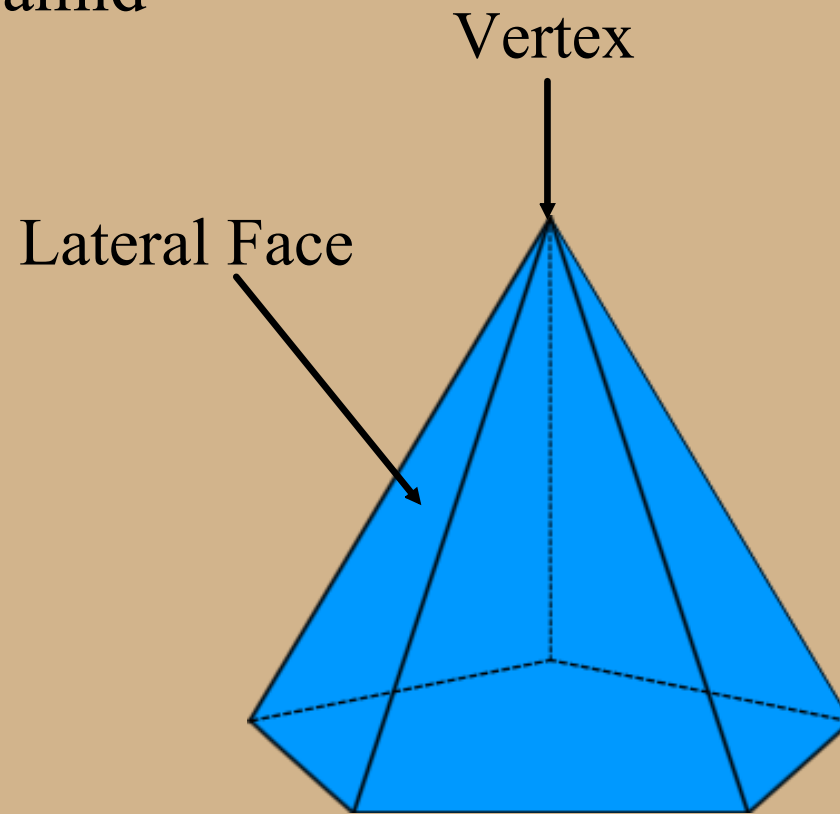




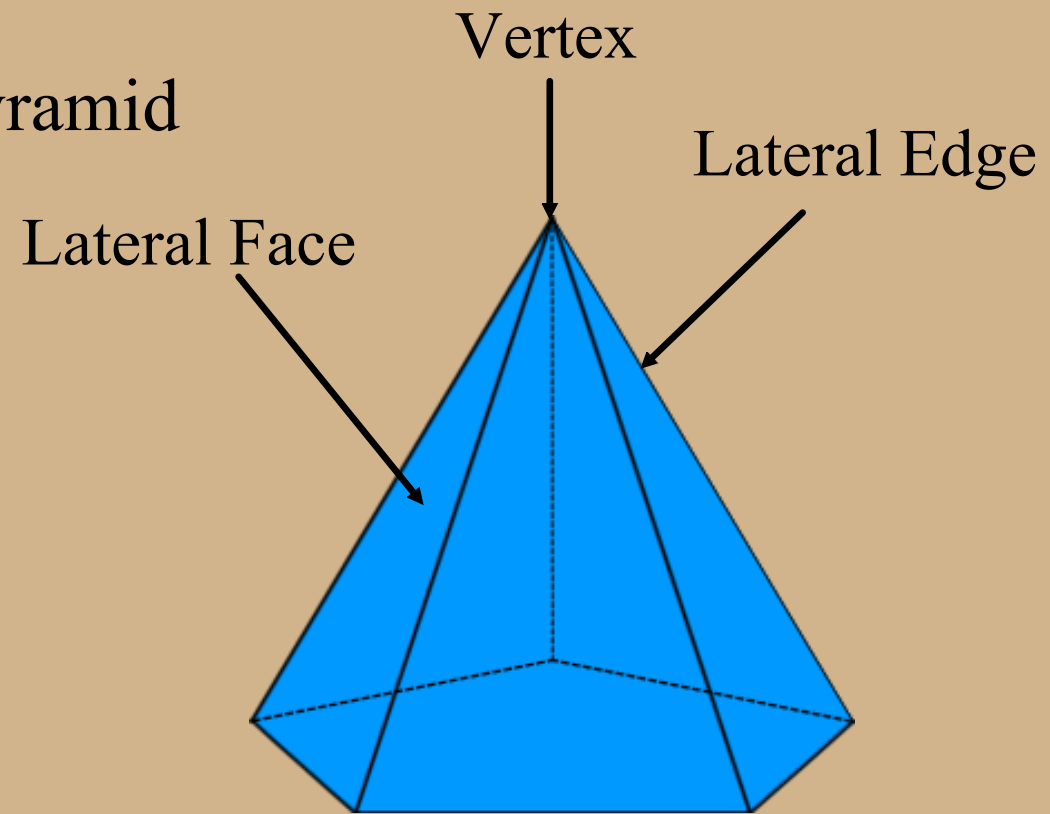
Regular Pentagon Pyramid



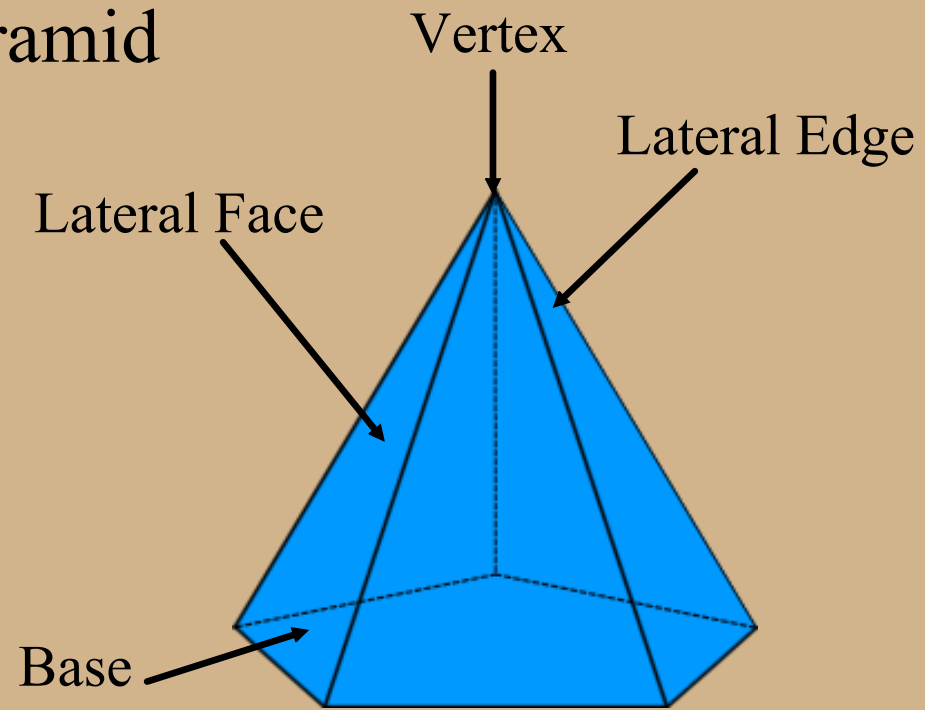
Regular Pentagon Pyramid



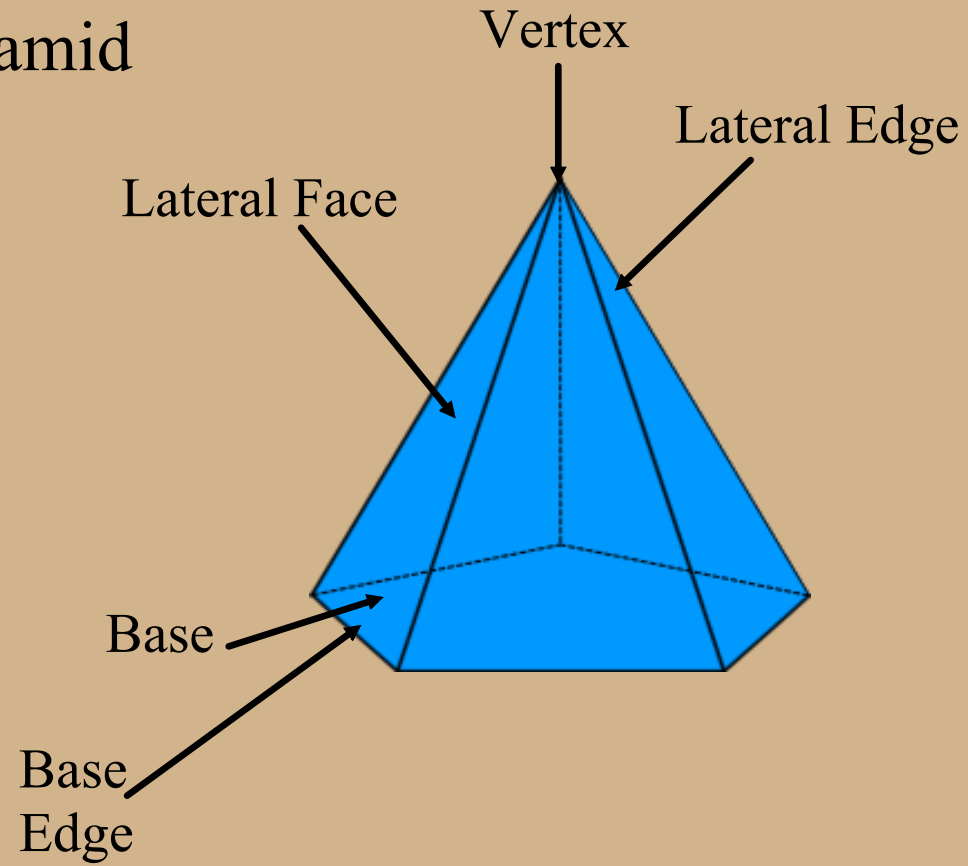
Regular Pentagon Pyramid



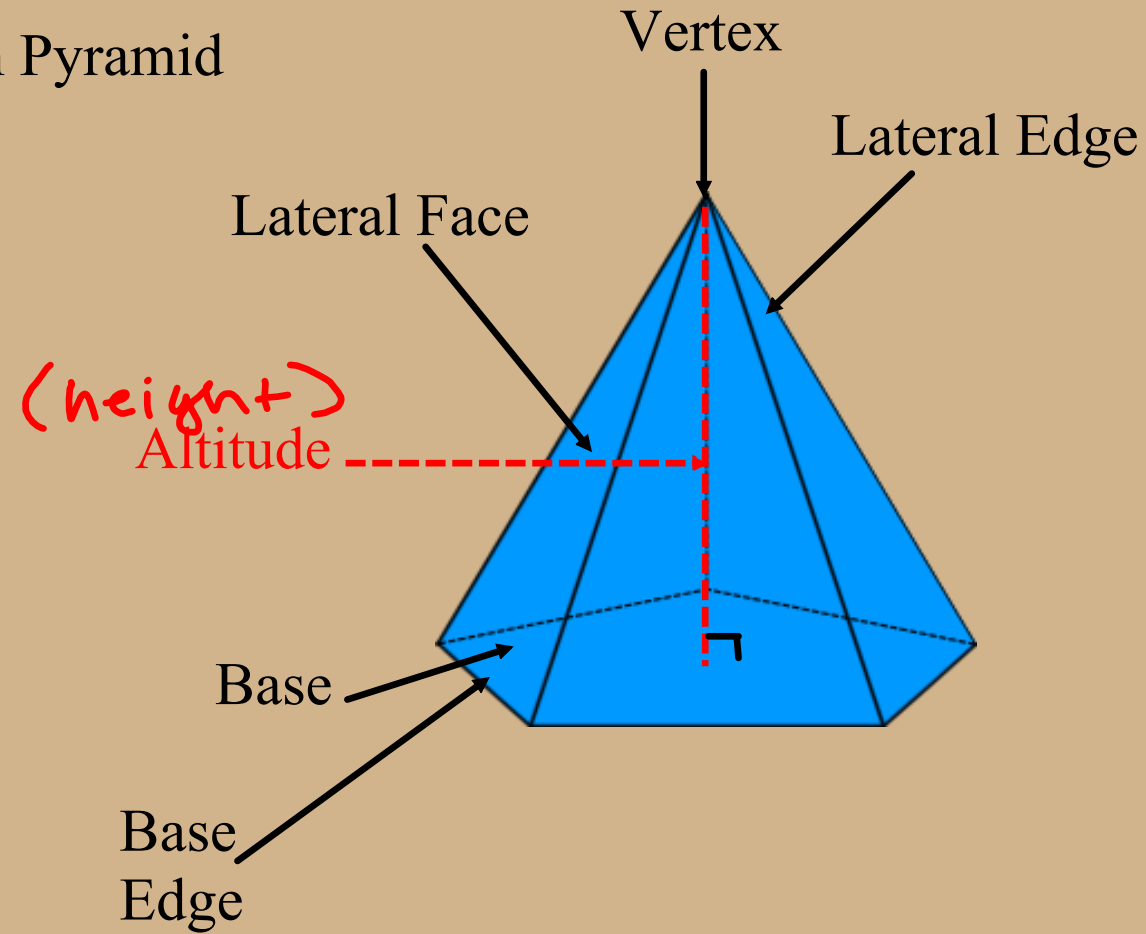
Regular Pentagon Pyramid



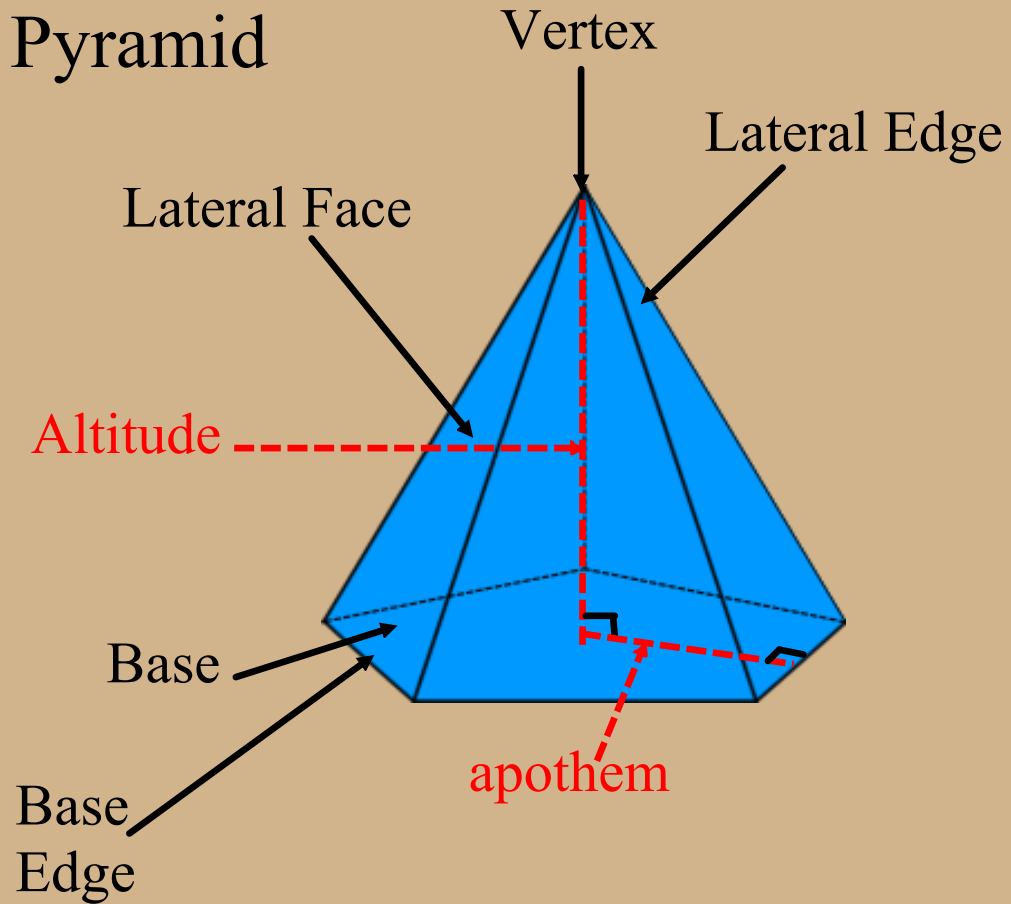
Regular Pentagon Pyramid



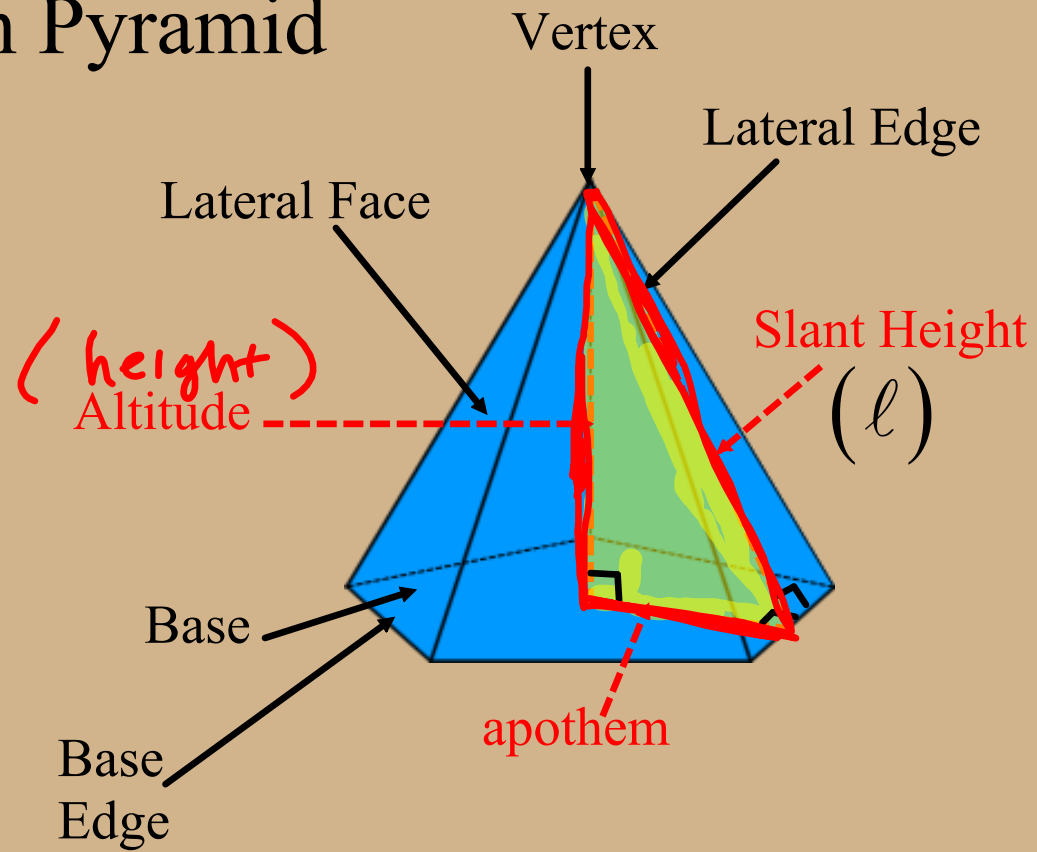
Regular Pentagon Pyramid



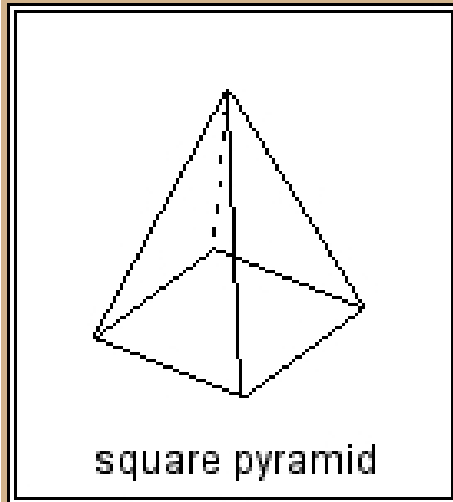
Regular Pentagon Pyramid



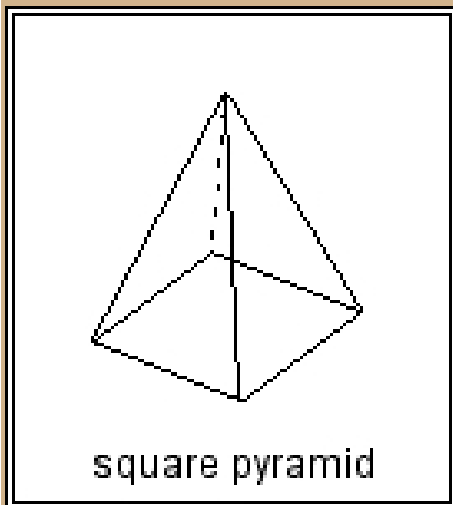
Regular Pentagon Pyramid



Lateral Area of a Pyramid is the sum of the areas of the congruent lateral faces.

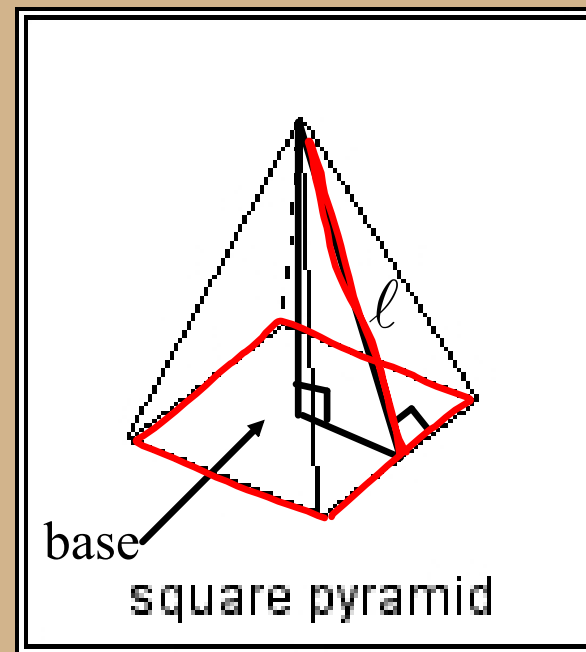


Surface Area of a Pyramid is the sum of the lateral area and one base.



The **Lateral Area of a Regular Pyramid** is half the product of the perimeter of the base and the slant height

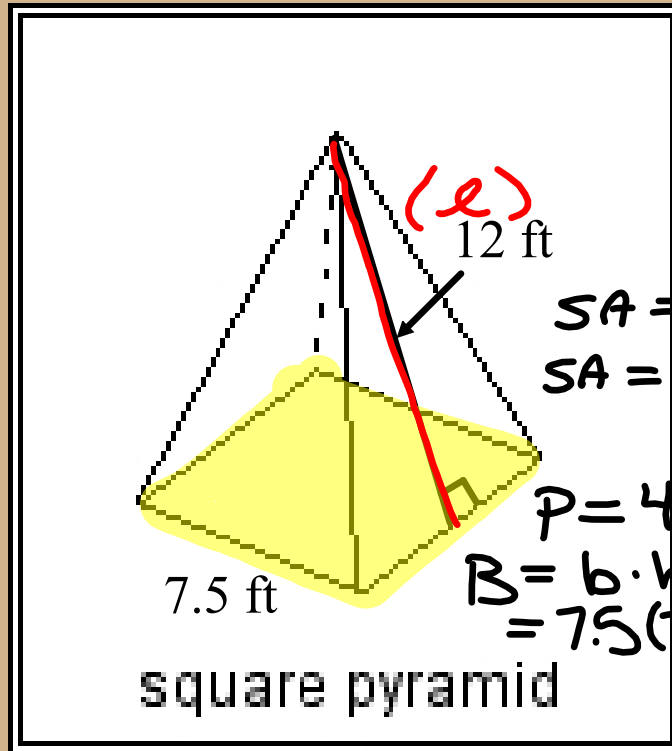
$$LA = \frac{1}{2} p \ell$$



The **Surface Area of a Regular Pyramid** is the sum of the lateral area and the area of one base.

$$SA = LA + B$$

1. Find the lateral area and surface area of a square pyramid with base edges 7.5 ft and slant height 12 ft.



$$LA = \frac{1}{2} P l$$

$$LA = \frac{1}{2} (30)(12)$$

$$LA = \frac{1}{2} (360)$$

$$LA = 180$$

$$SA = LA + B$$

$$SA = 180 + 56.25$$

$$P = 4(7.5)$$

$$B = b \cdot h$$

$$= 7.5(7.5)$$

$$l = 12$$

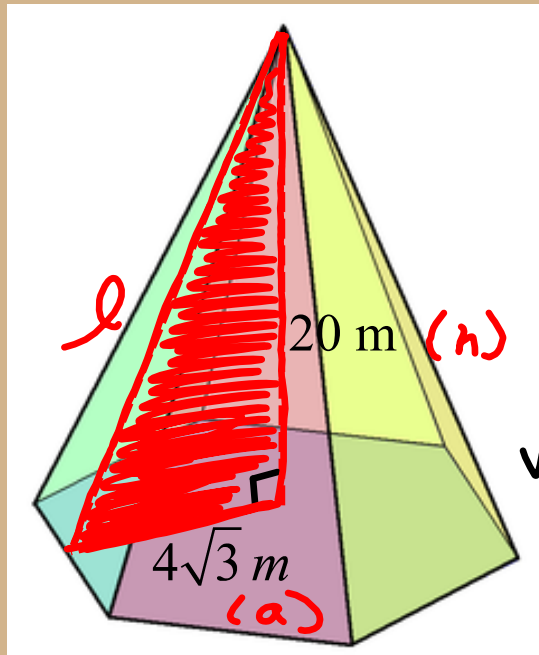
$$P = 30$$

$$B = 56.25$$

$$LA = 180 + 1^2$$

$$SA = 236.25 \text{ ft}^2$$

2. Find the lateral area and surface area of the hexagonal pyramid. Round answer to the nearest whole number.



$$\text{Height} = 20 \text{ m}$$

$$\text{Apothem} = 4\sqrt{3} \text{ m}$$

$$20^2 + (4\sqrt{3})^2 = l^2$$

$$400 + (4\sqrt{3})(4\sqrt{3}) = l^2$$

$$400 + 48 = l^2$$

$$\sqrt{l^2} = \sqrt{448}$$

$$l = 8\sqrt{7}$$

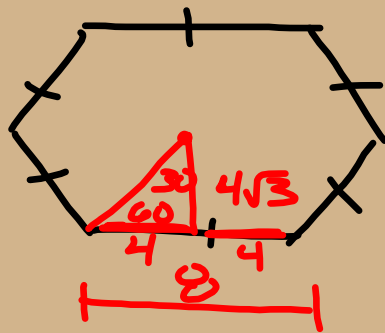
$$l = 8\sqrt{7}$$

$$P = 48$$

$$B = 96\sqrt{3}$$

$$LA = 192\sqrt{7} \text{ m}^2 \approx 508 \text{ m}^2$$

$$SA = 192\sqrt{7} + 96\sqrt{3} \text{ m}^2 \approx 674 \text{ m}^2$$



$$4\sqrt{3} = sL\sqrt{3}$$

$$4 = sL$$

$$P = 6(8)$$

$$B = \frac{1}{2} a P$$

$$= \frac{1}{2} (4\sqrt{3})(48) = 96\sqrt{3}$$

$$LA = \frac{1}{2} P l$$

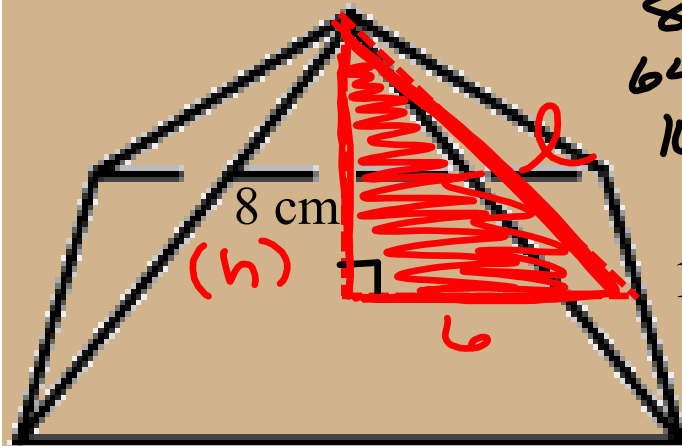
$$SA = LA + B$$

$$= \frac{1}{2} (48)(8\sqrt{7})$$

$$= 192\sqrt{7}$$

$$SA = 192\sqrt{7} + 96\sqrt{3}$$

3. Find the slant height of a square pyramid with base edge 12 cm and altitude 8 cm. Then find the lateral area and surface area of the square pyramid.



12 cm

$$8^2 + 6^2 = l^2$$

$$64 + 36 = l^2$$

$$100 = l^2$$

$$l = 10$$

12 cm

$$l = 10$$

$$P = 48$$

$$B = 144$$

$$LA = 240 \text{ cm}^2$$

$$SA = 384 \text{ cm}^2$$

$$LA = \frac{1}{2} P l$$

$$LA = \frac{1}{2} (48)(10)$$

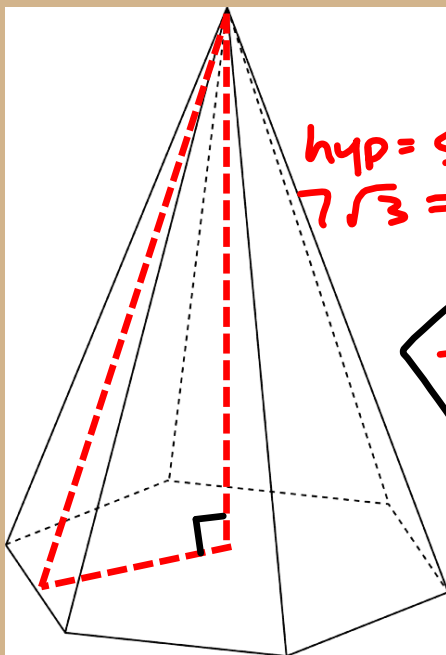
$$LA = 240$$

$$SA = LA + B$$

$$= 240 + 144$$

$$SA = 384$$

4. Find the lateral area and surface area of the hexagonal pyramid. Round your answer to the nearest whole number.



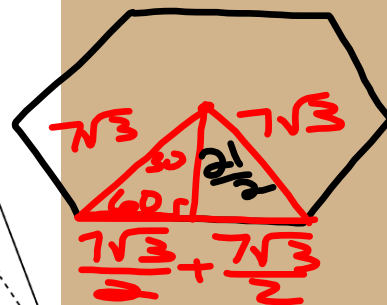
$$\ell = 24 \text{ ft}$$

$$\text{hyp} = s \cdot \ell \cdot 2 \quad \text{radius of base} = 7\sqrt{3} \text{ ft}$$

$$7\sqrt{3} = s \cdot \ell \cdot 2$$

$$\ell \ell = s \ell \sqrt{3}$$

$$\frac{7\sqrt{3}}{2} \cdot \sqrt{3}$$



$$\frac{7\sqrt{3}}{2} + \frac{7\sqrt{3}}{2}$$

$$\frac{14\sqrt{3}}{2} = 7\sqrt{3}$$

$$\ell = 24$$

$$P = 412\sqrt{3}$$

$$B =$$

Assignment:

pg 620-623 1-7, 18, 19, 20, 27, 30