

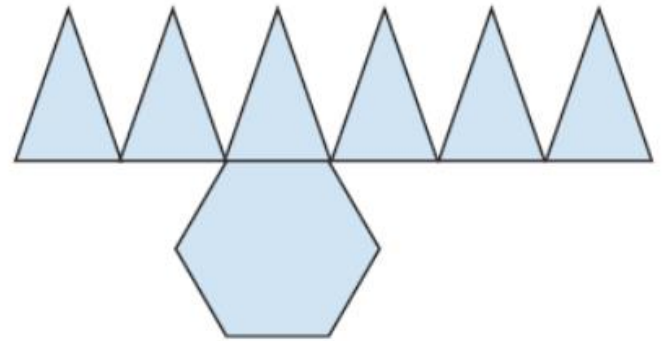
Geometry

Unit Three: Prisms & Pyramids (IC16)

Name: _____

Date: _____ Period: _____

Net: 2-D unfolded drawing of a solid



Lateral Area: (LA) Total area of all faces
EXCLUDING bases

Surface Area: (SA) Total area of all faces
INCLUDING bases

	Lateral Area	Surface Area	Volume
All Prisms	$= ph$	$= LA + 2B$	$= Bh$
Regular Pyramids	$= \frac{1}{2} p\ell$	$= LA + B$	$= \frac{Bh}{3}$

Task One: You need to know what all these letters stand for...

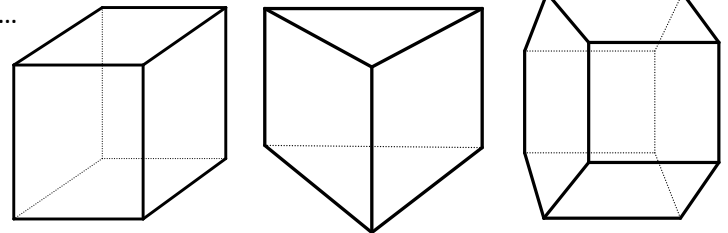
Prisms:

p = Perimeter of base

B = Area of base

h = Height of prism (dist. between bases)

*How to identify the base: Parallel congruent (non rectangle if they exist) faces

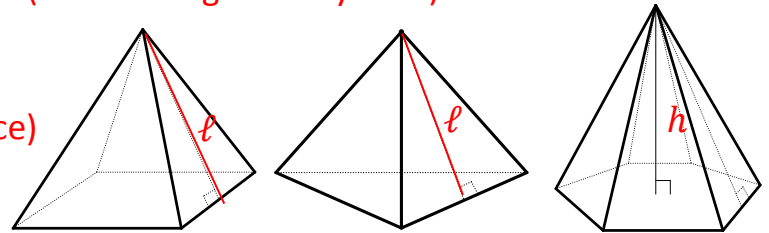


Pyramids:

p = Perimeter of base

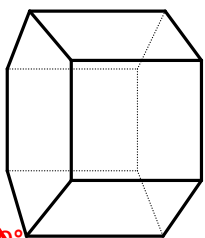
ℓ = Slant height (hgt of lateral face)

h = height of pyramid (from apex \perp to base)



Task Two: You need to find measures for anything that is missing necessary for evaluating the formula.

1. Given a regular hexagonal prism with an apothem of $5\sqrt{3}$ in, find the necessary information to solve for SA.



$$p = 10(6) = 60 \quad LA = ph$$

$$h = 8 \quad LA = 60(8)$$

$$a = 5\sqrt{3} \quad LA = 480$$

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

$$B = \frac{1}{2}(5\sqrt{3})(60)$$

$$B = 150\sqrt{3}$$

$$SA = LA + 2B$$

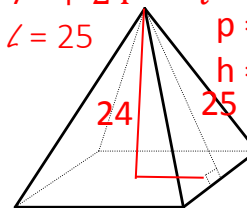
$$SA = 480 + 2(150\sqrt{3})$$

$$SA = 480 + 300\sqrt{3}$$

2. Given a square pyramid with a side length of 14 cm and a height of 24 cm, find the necessary information to solve for SA.

$$7^2 + 24^2 = \ell^2$$

$$\ell = 25$$



$$p = 14(4) = 56$$

$$h = 24$$

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

$$LA = \frac{1}{2} (56)(25)$$

$$LA = 700$$

$$B = 14^2 = 196$$

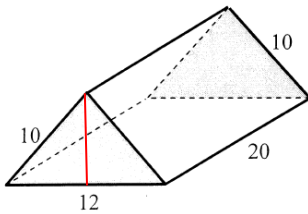
$$SA = LA + B$$

$$SA = 700 + 196$$

$$SA = 896$$

Task Three: You need to be able to organize your work and make it through these multi-step problems.

1. Find the lateral and surface area and volume of the right triangular prism. Be sure to show each part of your calculation and round your answer to one decimal place if necessary (tenths).



$$p = 10 + 10 + 12 = 32$$

$$h^2 + 6^2 = 10^2$$

$$h = 8$$

$$LA = ph$$

$$LA = (32)(20)$$

$$LA = 640 \text{ u}^2$$

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

$$B = \frac{1}{2} (12)(8)$$

$$B = 48 \text{ u}^2$$

$$SA = LA + 2B$$

$$SA = 640 + (2)(48)$$

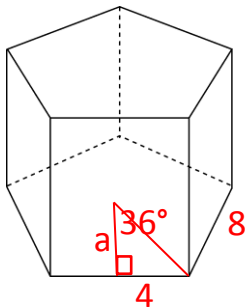
$$SA = 736 \text{ u}^2$$

$$V = Bh$$

$$V = (48)(20)$$

$$V = 960 \text{ u}^3$$

2. Find the lateral area and surface area and volume of the regular right pentagonal prism with a base edge of 8 cm and a height of 12 cm. Be sure to show each part of your calculation and round your answer to one decimal place (tenths).



$$\tan 36 = \frac{4}{a}$$

$$a = \frac{4}{\tan 36} = 5.5$$

$$LA = ph$$

$$LA = (40)(12)$$

$$LA = 480 \text{ cm}^2$$

$$SA = LA + 2B$$

$$SA = 480 + (2)(110)$$

$$SA = 700 \text{ cm}^2$$

$$V = Bh$$

$$V = (110)(12)$$

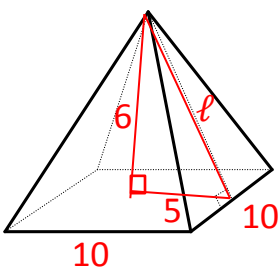
$$V = 1320 \text{ cm}^3$$

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

$$B = \frac{1}{2} (5.5)(40)$$

$$B = 110 \text{ cm}^2$$

3. Find the lateral area and surface area and volume of the square pyramid below if the base edges are 10 cm and the height of the pyramid is 6 cm. Round your answer to one decimal place (tenths).



$$6^2 + 5^2 = l^2$$

$$l \approx 7.8$$

$$LA = \frac{1}{2} pl$$

$$LA = \frac{1}{2} (40)(7.8)$$

$$LA = 156 \text{ cm}^2$$

$$SA = LA + B$$

$$SA = 156 + 100$$

$$SA = 256 \text{ cm}^2$$

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

$$V = \frac{100(6)}{3}$$

$$V = 200 \text{ cm}^3$$

$$B = 10(10)$$

$$B = 100 \text{ cm}^2$$