Monday, June 1, 2020

Sec 11-5: Volumes of Pyramids & Cones.

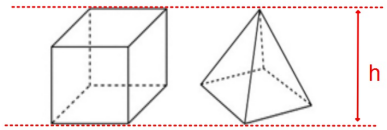
Volume of a Prism:

$V = Bh$

Volume of a Cylinder:

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

Given the square prism and square pyramid have the same Base and height.



How many pyramids do you think it will take to fill up the prism?

Watch the demonstration about the relationship between the volume of a Pyramid and a Prism:

www.youtube.com/watch?v=rTs9HwWiBaI

If you have a Prism and a Pyramid with the same Base and Height then from the previous demonstration we now know that the following is true:

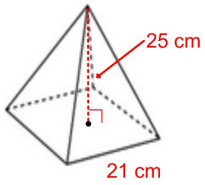
Volume of Prism = (3)(Volume of Pyramid)

Volume of a Pyramid:

$V = \frac{1}{3}$(Volume of Prism)

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

Find the volume of this square pyramid to the nearest hundredth.



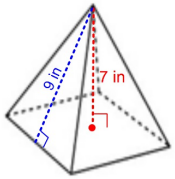
$V = \frac{1}{3}Bh$

h = 25 cm

B = area of square base
= (21)(21) = 441 cm^2

$V = \frac{1}{3}(441\ cm^2)(25\ cm) = 3675\ cm^3$

Find the volume of this square pyramid to the nearest hundredth.



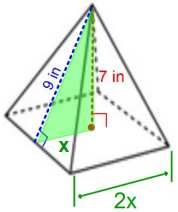
$V = \frac{1}{3}Bh$

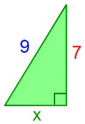
h = 7 in

9 in. is the slant height

B = area of square base
= $(side)^2$

See the next page for the process of finding B





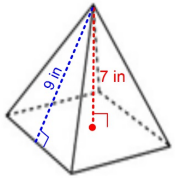
$x^2 + 7^2 = 9^2$

$\sqrt{x^2} = \sqrt{9^2 - 7^2}$

$x = 5.66$ in.

Side length of Square Base = $2x = 2(5.66) = 11.32$ in

$B = (11.32 \text{ in})^2 = \boxed{128.14 \text{ in}^2}$

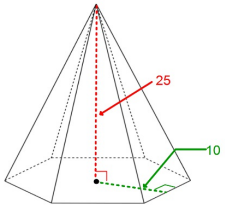


$V = \frac{1}{3}Bh$

$V = \frac{1}{3}(128.14 \text{ in}^2)(7 \text{ in})$

$V = \boxed{298.99 \text{ in}^3}$

Find the volume of this hexagonal pyramid to the nearest tenth.



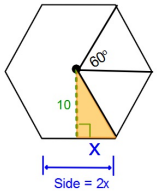
$V = \frac{1}{3}Bh$

$h = 25$

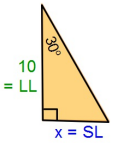
10 is the apothem of the Base.

See next page to find B

B = area of a regular hexagon



$= \frac{1}{2}ap$ $\quad \boxed{a = 10}$



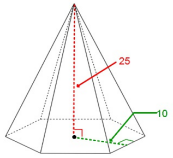
$x = SL = \frac{LL}{\sqrt{3}} = \frac{10}{\sqrt{3}} = 5.77$

Side = $2x = 2(5.77) = 11.54$

p = perimeter = $6(11.54)$

$\boxed{p = 69.24}$

$B = \frac{1}{2}(10)(69.24) = \boxed{346.2}$

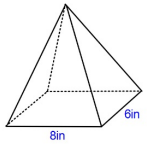


$V = \frac{1}{3}Bh$

$h = 25$

$B = 346.2$

$V = \frac{1}{3}(346.2)(25) = 2885$



The volume of this rectangular pyramid is 210 in^3.
Find the height to the nearest hundredth.

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

$V = 210\ in^3$

$B = (8\ in)(6\ in) = 48\ in^2$

$210 = \frac{1}{3}(48)h$

$630 = (48)h$

$3 \cdot 210 = \frac{1}{3}(48)h \cdot 3$

$\frac{630}{48} = \frac{(48)h}{48}$

$h = 13.13\ in$

You can now do the first three problems of Practice #27.

We'll continue this material tomorrow.

Practice #27 will be due on Sunday, June 7 by 10:00 pm