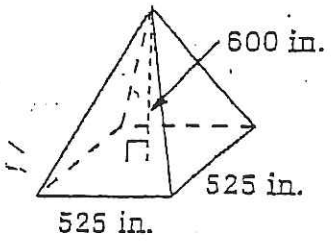
Integrated I

Volume of Pyramids

Key

Find the volume of this rectangular pyramid.

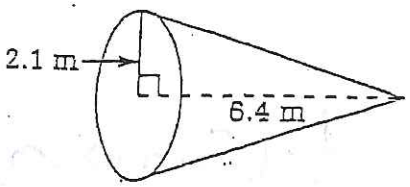


Volume of a Pyramid = $\frac{1}{3}$ * Area of Base * Height

$V_{PY} = \frac{1}{3} \cdot (525in \cdot 525in) \cdot 600in$

$V_{PY} = 55{,}125{,}000\ in^3$

Find the volume of the cone below.



Volume of a cone = $\frac{1}{3}$ * Area of Base * Height

$V_{cn} = \frac{1}{3} \cdot (\pi (2.1m)^2) \cdot 6.4m$

$V_{cn} = 9.408\pi\ m^3$

$V_{cn} \approx 29.6\ m^3$

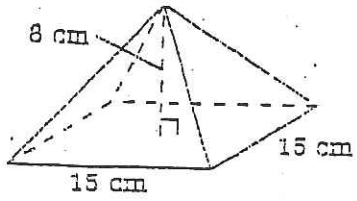
Integrated 1 Name: Key

Volume – Pyramids

Pyramid Volume = $\frac{1}{3} \cdot B \cdot h$

Square Pyramids or Cones

Find the volume of each space figure. Show your work.

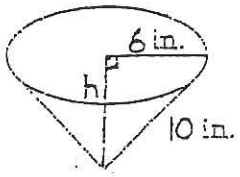
1. 

$= \frac{1}{3} \cdot (15cm \cdot 15cm) \cdot 8cm$

$V = 600 cm^3$

2. Find the dotted height.

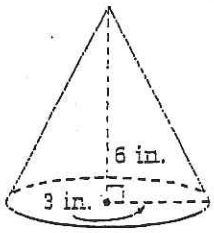
$h = 8 in$



$= \frac{1}{3} \cdot (\pi \cdot (6in)^2) \cdot 8in$

$V = 96\pi\ in^3$

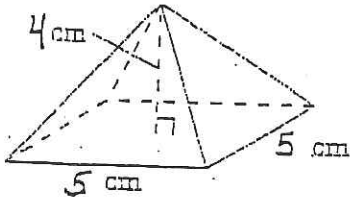
$V \approx 301.6\ in^3$

3. 

$= \frac{1}{3} \cdot (\pi \cdot (3in)^2) \cdot 6in$

$V = 18\pi\ in^3$

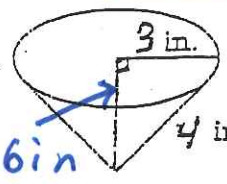
$V \approx 56.5\ in^3$

4. 

$= \frac{1}{3} \cdot (5cm \cdot 5cm) \cdot 4cm$

$V = \frac{100}{3} cm^3 = 33\frac{1}{3} cm^3$

$V \approx 33.3 cm^3$

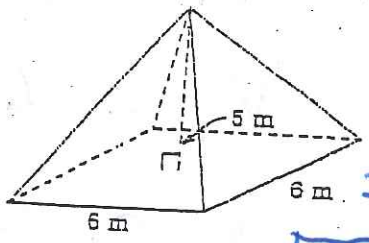
5. 

$h \approx 2.6 in$

$= \frac{1}{3} \cdot (\pi (3in)^2) \cdot 2.6in$

$V = 7.8\pi\ in^3$

$V \approx 24.5\ in^3$



$= \frac{1}{3} \cdot (6m \cdot 6m) \cdot 5m$

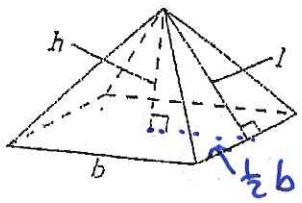
$V = 60\ m^3$

Key

Use the regular square pyramid at the right.
Find the volume of the pyramid, using each set of measurements.

Volume of a Square Pyramid = $\frac{1}{3} \cdot B \cdot h$

7. b = 12 m
l = 13 m



$h^2 + 6^2 = 13^2$

$h^2 + 36 = 169$

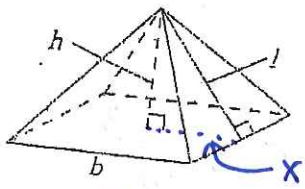
$h^2 = 133$

$h \approx 11.5\text{ m}$

$V = \frac{1}{3} \cdot (12\text{m} \cdot 12\text{m}) \cdot 11.5\text{m}$

$V \approx 552\text{ m}^3$

8. h = 11 cm
l = 61 cm



$x^2 + 11^2 = 61^2$

$x^2 + 121 = 3{,}721$

$x^2 = 3{,}600$

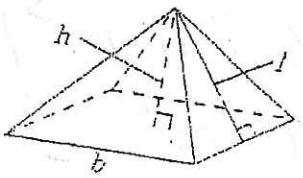
$x = 60\text{ cm}$

$b = 2x = 120\text{ cm}$

$V = \frac{1}{3} \cdot (120\text{ cm} \cdot 120\text{cm}) \cdot 11\text{cm}$

$V = 52{,}800\text{ cm}^3$

9. b = 42 inches
h = 28 inches



$V = \frac{1}{3} \cdot (42\text{in} \cdot 42\text{in}) \cdot 28\text{in}$

$V = 16{,}464\text{ in}^3$

10. A soft-ice-cream store has two sizes of waffle cones. The small size has a radius of 1.5 inches and a height of 4 inches. The large size has a radius of 2 inches and a height of 6 inches. WOW! Suppose each cone were filled with ice cream and leveled off at the t... What is the difference in amount of ice cream between the large and small size?

Large cone $V = \frac{1}{3} \cdot (\pi (2\text{in})^2) \cdot 6\text{in}$

$V = 8\pi\text{ in}^3$

Small cone $V = \frac{1}{3} \cdot (\pi (1.5\text{in})^2) \cdot 4\text{in}$

$V = 3\pi\text{ in}^3$

Difference: $8\pi\text{ in}^3 - 3\pi\text{ in}^3 = 5\pi\text{ in}^3$

$\approx 15.7\text{ in}^3$