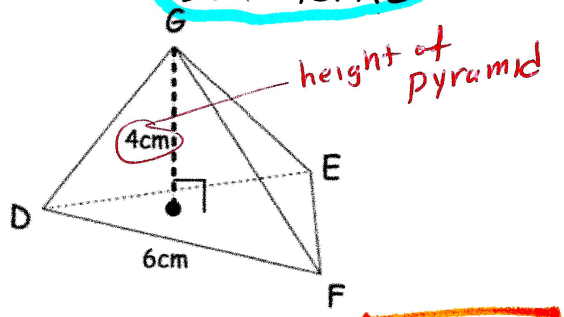
Geo Practice #27 Sec 11-5 to 11-7 Mon to Fri, June 1 to 5, 2020

SOLUTIONS

For 1 and 2 find the volume of each. Round to the nearest hundredth unless noted otherwise.

1. Triangular Pyramid. The Base, $\triangle DEF$, is an ~~Isosceles~~ EQUILATERAL triangle.

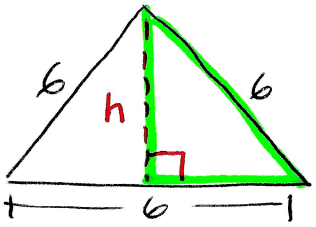


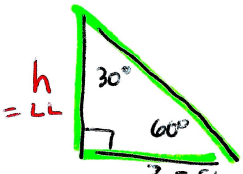
Vol = $\frac{1}{3}(9\sqrt{3})(4) = 20.78\ cm^3$

$V = \frac{1}{3} B \cdot h$

$h = 4cm$ height of pyramid

BASE:

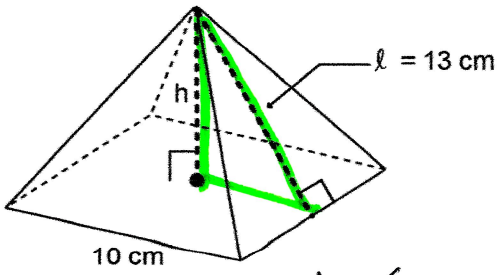




$h = LL = SL \cdot \sqrt{3} = 3\sqrt{3}$

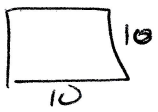
$B = \frac{1}{2} bh = \frac{1}{2} 6(3\sqrt{3}) = 9\sqrt{3}$

2. Square Pyramid.

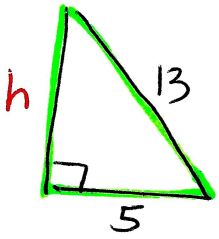


Vol = $\frac{1}{3} Bh = \frac{1}{3}(100cm^2)(12cm) = 400\ cm^3$

Base:



$B = (10)^2 = 100\ cm^2$



$h^2 + 5^2 = 13^2$

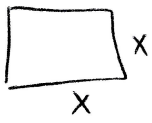
$\sqrt{h^2} = \sqrt{13^2 - 5^2}$

$h = 12cm$

3. The Volume of a Square Pyramid is 200 cm^3. The Height of the pyramid is 10 cm. Find the length of each Base Edge to the nearest hundredth.

Length of Base Edge = 7.75 cm

Base:



$B = x^2$

height = 10cm

Vol = 200 cm^3

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

$\frac{200}{10} = \frac{1}{3}(x^2)\frac{(10)}{10}$

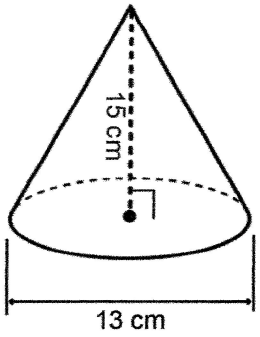
$3 \cdot 20 = \frac{1}{3} x^2 \cdot 3$

$\sqrt{60} = \sqrt{x^2}$

$x = 7.75$

For 4 and 5 find the volume of each cone.

4. Leave the answer in terms of π.



211.25π cm³

Vol = $\frac{1}{3}(42.25\pi)(15)$

$= 663.66$ cm³ if round to nearest hundredth

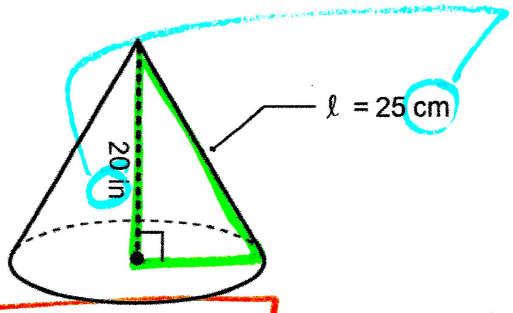
$V = \frac{1}{3}\pi r^2 \cdot h$

$h = 15$ cm

13 cm = dia $\rightarrow$ $r = \frac{13}{2} = 6.5$ cm

$B = \pi r^2 = \pi(6.5)^2 = 42.25\pi$

5. Give answer to nearest hundredth.

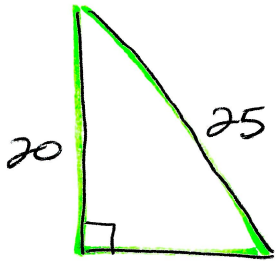


units were intended to be the SAME so ignore them for this problem.

Vol = 4712.39

$V = \frac{1}{3}\pi r^2 h$

$h = 20$ in



$20^2 + r^2 = 25^2$

$\sqrt{r^2} = \sqrt{25^2 - 20^2}$

$r = 15$

$B = \pi r^2 = \pi(15)^2$

$B = 225\pi$

$V = \frac{1}{3}(225\pi)(20)$

$= 4712.39$

6. A Cone with volume 500 cm³ has a height of 12 cm. Find the length of the radius of the Base to the nearest hundredth.

$r =$ 6.31 cm

$V_{cone} = \frac{1}{3}\pi r^2 h$

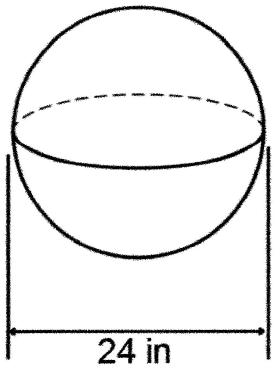
$3 \cdot 500 = \frac{1}{3}\pi r^2 \cdot 12 \cdot 3$

$\frac{1500}{12\pi} = \frac{\pi r^2 \cdot 12}{12\pi}$

$\sqrt{r^2} = \sqrt{\frac{1500}{12\pi}}$

$r = 6.31$

7. Find the Surface Area of this Sphere. Leave answer in terms of π.



SA = $576\pi\ in^2$

24 in = dia

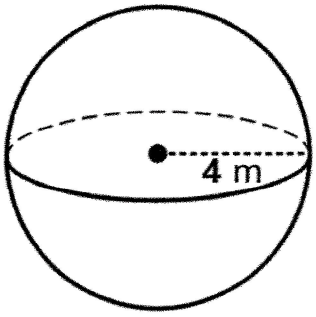
$r = \frac{24}{2} = 12$ in

$SA = 4\pi r^2$

$= 4\pi(12)^2$

$= 576\pi$

8. Find the Volume of this Sphere to the nearest hudredth.



Vol = $268.08\ m^3$

$V = \frac{4}{3}\pi(4)3$

$= \frac{4}{3}\pi \cdot 64$

$= 268.08$

9. The Surface Area of a Sphere is 360 cm^2. Find its Volume to the nearest hundredth.

Vol = $641.43\ cm^3$

1st : use SA to find radius

$SA = 4\pi r^2$

$\frac{360\ cm^2}{4\pi} = \frac{4\pi r^2}{4\pi}$

$\sqrt{\frac{360}{4\pi}} = \sqrt{r^2}$

$r = 5.35$ cm

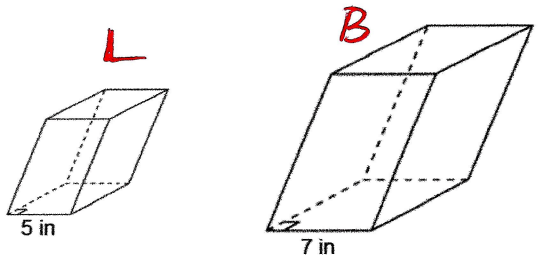
2nd use radius to find Vol.

$V = \frac{4}{3}\pi r3$

$= \frac{4}{3}\pi(5.35)^3$

$= 641.43$

10. The two solids shown are similar. If the Volume of the larger one is 1500 cm^3 find the Volume of the smaller one to the nearest hundredth.



Vol of smaller = 546.65 cm^3

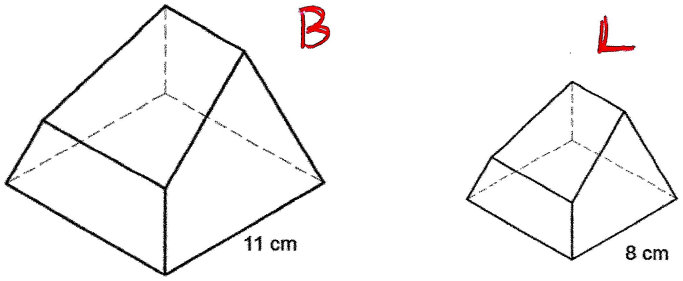
Similarity Ratio = $\frac{L}{B} = \frac{5}{7}$

Ratio of Volumes = $\left(\frac{5}{7}\right)^3 = \frac{125}{343}$

$\frac{L}{B}$: $\frac{125}{343} = \frac{X}{1500}$

$X = 546.65$

11. The two solids shown are similar. If the SA of the smaller one is 850 in^2 find the SA of the larger one to the nearest hundredth.



SA of larger = 1607.03 in^2

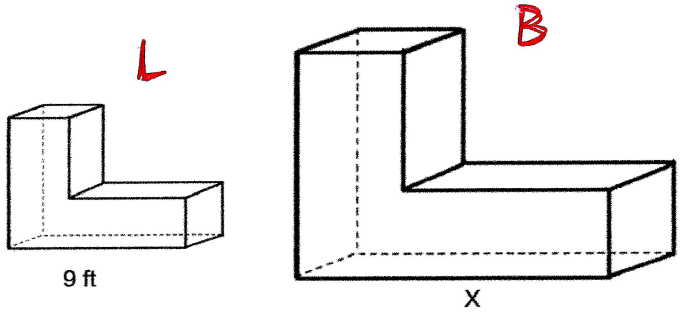
Similarity Ratio = $\frac{L}{B} = \frac{8}{11}$

Ratio of SA = $\left(\frac{8}{11}\right)^2 = \frac{64}{121}$

$\frac{L}{B}$: $\frac{64}{121} = \frac{850}{X}$

$X = 1607.03$

12. The two solids shown are similar. The Volume of the larger one is 2197 ft^3 and the Volume of the smaller one is 512 ft^3. Find the value of x to the nearest hundredth.



x = 14.63 ft

Similarity Ratio = $\frac{L}{B} = \frac{9}{x}$

Ratio of Vol : $\left(\frac{9}{x}\right)^3 = \frac{729}{x^3}$

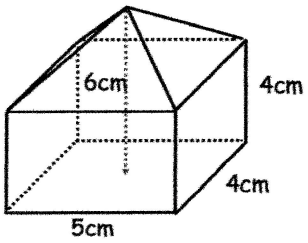
$\frac{L}{B}$: $\frac{729}{x^3} = \frac{512}{2197}$

$512\,x^3 = 1{,}601{,}613$

$\sqrt[3]{x^3} = \sqrt[3]{\frac{1{,}601{,}613}{512}}$

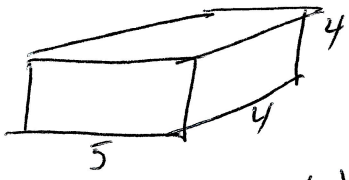
$x = 14.63$

13. The composite solid shown below is made by putting a rectangular pyramid on top of a rectanglular prism. The prism and pyramid have congruent Bases. Find the volume of this solid to the nearest hundredth.



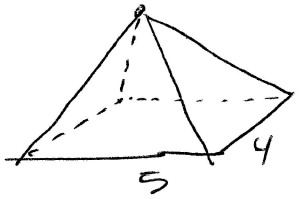
Vol = 80 + 13.33 = 93.33 cm³

Rect Prism



Vol = (5)(4)(4)
= 80 cm³

Rect pyramid

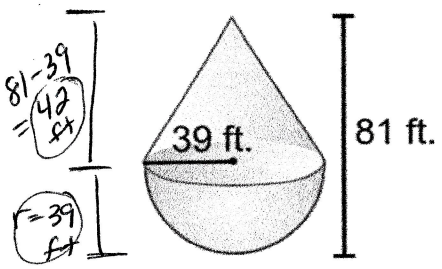


$V = \frac{1}{3} B \cdot h$

$B = (5)(4) = 20$

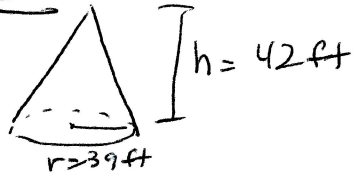
$V = \frac{1}{3}(20)(2) = 13.33 cm^3$

14. Find the volume of this composite solid formed by putting a cone together with a hemisphere. Round to the nearest hundredth.



Vol = 66,897.07 + 124,237.42
cone hemisphere
= 191,134.49 ft³

Cone



$V = \frac{1}{3}\pi r^2 h$

$= \frac{1}{3}\pi(39)^2(42)$

$= 66,897.07 ft^3$

hemisphere r = 39ft

$Vol = \left(\frac{4}{3}\pi r^3\right) \cdot 1/2$

$= \left(\frac{4}{3}\pi(39)^3\right) \cdot 1/2$

$= 124,237.42$

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