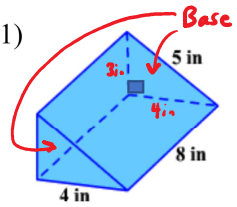
11.2

Thursday, April 29, 2021 2:18 PM

11.2 Worksheet

For #1 – 3, find the volume of each shape. Exact answers only (no decimals.)

1)



$V = Bh$

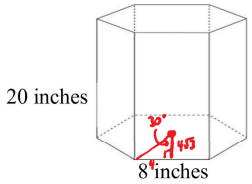
$V = \left(\frac{1}{2}bh\right)h$

$V = \left(\frac{1}{2}(4)(3)\right)(8)$

$= 6(8)$

$V = 48\ in^3$

2) regular hexagonal prism



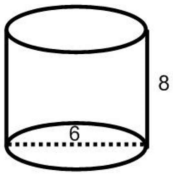
$V = Bh$

$= \left(\frac{1}{2}aP\right)h$

$= \frac{1}{2}(4\sqrt{3})(48)(20)$

$V = 1920\sqrt{3}\ in^3$

3)



$d = 6$

$r = 3$

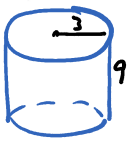
$V = \pi r^2 h$

$= \pi(3)^2(8)$

$V = 72\pi\ u^3$

For #4 – 7: Not-On-Your-Belly Low-Sugar Jelly comes in 2 different jars at 2 different prices. The larger jar, with a height of 9 inches and radius of 3 inches, costs $6.25. The smaller jar is $1.49 and has a height and radius of 7 inches and 2 inches respectively.

4) What is the price per cubic inch of jelly for the large jar?



$V = \pi r^2 h$

$= \pi(3)^2(9)$

$V = 81\pi\ in^3 \approx 254.47\ in^3$

$Cost/in^3 = \frac{6.25}{81\pi} = 0.025\ \$/in^3$

5) What is the price per cubic inch of jelly for the smaller jar?

$V = \pi r^2 h$

$= \pi(2)^2(7)$

$V = 28\pi\ in^3 \approx 87.96\ in^3$

$Cost/in^3 = \frac{1.49}{27\pi} \approx 0.017\ \$/in^3$

6) A recipe calls for exactly 500 cubic inches of jelly and there is none at the house. Any remaining amount of jelly is wasted! How much money would need to be spent on 500 cubic inches of jelly only buying large jars?

$\frac{500}{81\pi} \approx 1.96$

6.25×2

$\$12.50$

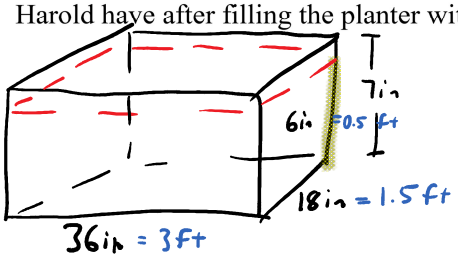
7) How much money would need to be spent on 500 cubic inches of jelly only buying small jars?

$\frac{500}{27\pi} \approx 5.68$

1.49×6

$\$8.94$

8) A planter in the shape of a rectangular prism has a length of 36 inches, a height of 7 inches, and a width of 18 inches. The planter needs to be filled to 1 inches below the top. Harold purchases 2.5 ***cubic feet*** of soil to fill the planter. How much extra soil (in cubic feet) will Harold have after filling the planter with soil up to 1 inch below the top?



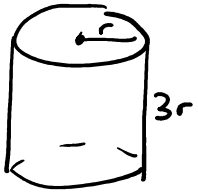
$V = Bh$

$= 3(1.5)(0.5)$

$V = 2.25\ ft^3$

$2.5 - 2.25 = 0.25\ ft^3$

9) You want to design a cylindrical container for paint that has a volume of 120 in^3, and you want the height of the container to be 3 times the radius. To the nearest hundredth of an inch, find the radius of the container.



$V = \pi r^2 h$

$= \pi r^2 (3r)$

$V = 3\pi r^3$

$\frac{120}{3\pi} = \frac{3\pi r^3}{3\pi}$

$\sqrt[3]{\frac{40}{\pi}} = \sqrt[3]{r^3}$

$2.34\text{in} \approx r$

10) A cylinder has a volume of 162π cubic inches and a diameter of 6 inches. What is the height of the cylinder? Exact answers only (no decimals.)

$V = \pi r^2 h$

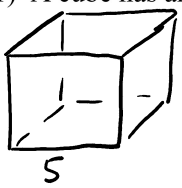
$162\pi = \pi (3)^2 h$

$162\pi = 9\pi h$

$h = \frac{162\pi}{9\pi}$

$h = 18\text{in}$

11) A cube has an edge of 5 mm. Find the V of the cube.



$V = s^3$

$V = 5^3 = 125\ mm^3$

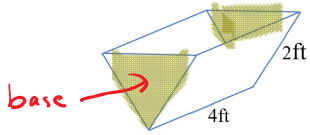
12) A farmer needs to build a water trough that holds at least 50 gallons of water. The farmer is planning to build a trough in the shape of a triangular prism. The trough will have two equilateral triangles for sides and will be 4 ft long. If there are 7.48 gallons in a cubic foot of water, will the farmers trough hold enough water?

$V = Bh$

$V = \left(\frac{s^2\sqrt{3}}{4}\right)h$

$V = \frac{2^2\sqrt{3}}{4}(4)$

$= 4\sqrt{3}\ ft^3$



$7.48(4\sqrt{3}) = 51.82\ gal$

Yes

Answers:

1) 48 in^3 2) $1920\sqrt{3}$ in 3) 72π u^3 4) \$0.02 per in^3 5) \$0.02 per in^3

6) \$12.50 7) \$8.94 8) 0.25 ft^3 9) 2.34 in 10) $\frac{9}{2}in$

11) V = 125 mm^3 12) Yes, it can hold 51.82 gallons.