BECA / Dr. Huson / Geometry
Unit 8: Year-to-date Regents review
27 February 2023

Name: Solutions

8.4 Classwork: Area, volume, density, solids

1. Find the volume of a rectangular prism with length 5 cm, width 10 cm, and height 8 cm.

$V = 5 \cdot 10 \cdot 8 = 400 \text{ cm}^3$

2. Find the volume of a pyramid ($V = \frac{1}{3}Bh$) having a height of 13 inches and with a square base having side lengths of 6 inches. Express your result to the *nearest cubic inch.*

$V = \frac{1}{3} 6^2 (13)$

$= 156 \text{ in}^3$

3. Find the volume of a sphere with a radius of 3 inches, to the *nearest whole cubic inch.* (The formula for the volume of a *sphere* is $V = \frac{4}{3}\pi r^3$)

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

$= 113.097...$

$\approx 113 \text{ in}^3$

4. A child's tent can be modeled as a pyramid with a square base whose sides measure 60 inches and whose height measures 84 inches. What is the volume of the tent, to the *nearest cubic foot?*

60 inches = 5 ft
84 inches = 7 ft.

$V = \frac{1}{3} 5^2 (7)$

$= 58.333...$

$\approx 58 \text{ ft}^3$

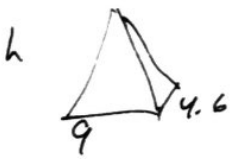
5. Randy's basketball is in the shape of a sphere with a maximum circumference of 29.5 inches. Determine and state the volume of the basketball, to the *nearest cubic inch.*

$C = 2\pi r = 29.5$

$r = 29.5/(2\pi) = 4.5355...$

$V = \frac{4}{3}\pi r^3 = 390.916... \approx 391 \text{ in}^3$

6. The base of a pyramid is a rectangle with a width of 4.6 cm and a length of 9 cm. What is the height, in centimeters, of the pyramid if its volume is 82.8 cm^3?



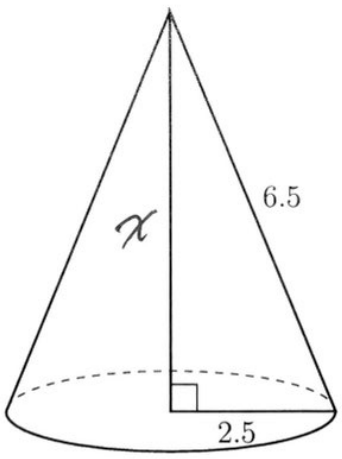
$V = \frac{1}{3}(9)(4.6)h = 82.8$

$h = 6 \text{ cm}$

7. As shown in the diagram below, the radius of a cone is 2.5 cm and its slant height is 6.5 cm.

$2.5^2 + x^2 = 6.5^2$

$x = 6 \text{ cm}$



How many cubic centimeters are in the volume of the cone? Express your answer in terms of π.

$V = \frac{1}{3}\pi(2.5)^2(6) = 39.2699...$

≈ 39

$= \frac{25}{2}\pi$

8. Lou has a solid clay brick in the shape of a rectangular prism with a length of 8 inches, a width of 3.5 inches, and a height of 2.25 inches. If the clay weighs 1.055 oz/in^3, how much does Lou's brick weigh, to the nearest ounce?

$V = 8 \cdot 3.5 \cdot 2.25 = 63 \text{ in}^3$

$W = 63 \cdot 1.055 = 66.465$

$\approx 66 \text{ oz.}$

9. A rectangular tabletop will be made of maple wood that weighs 43 pounds per cubic foot. The tabletop will have a length of eight feet, a width of three feet, and a thickness of one inch. Determine and state the weight of the tabletop, in pounds.

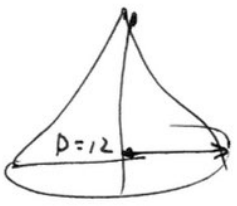
$V = 8 \cdot 3 \cdot \left(\frac{1}{12}\right) = 2 \text{ cubic ft}$

$W = 43 \cdot 2 = 86 \text{ lbs}$

10. A cone has a volume of 108π and a base diameter of 12. What is the height of the cone?

$V = \frac{1}{3} \pi 6^2 h = 108\pi$

$h = 9$



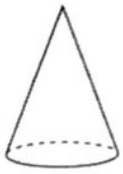
3-D rotation

11. If a rectangle is continuously rotated around one of its sides, what is the three-dimensional figure formed?

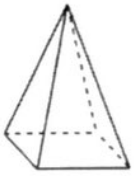
(a) cone
(b) sphere
(c) cylinder
(d) rectangular prism

12. A student has a rectangular postcard that he folds in half lengthwise. Next, he rotates it continuously about the folded edge. Which three dimensional object below is generated by this rotation?

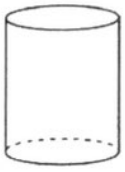
(a) cone



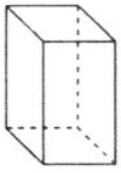
(b) pyramid



(c) cylinder



(d) rectangular prism



13. An isosceles right triangle whose legs measure 6 is continuously rotated about one of its legs to form a three-dimensional object. The three-dimensional object is a

(a) cylinder with a diameter of 6

(b) cylinder with a diameter of 12

(c) cone with a diameter of 6

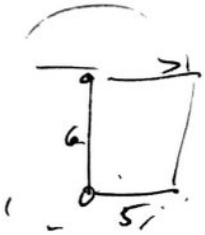
(d) cone with a diameter of 12

14. Which three-dimensional figure will result when a rectangle 6 inches long and 5 inches wide is continuously rotated about the longer side?

(a) a rectangular prism with a length of 6 inches, width of 6 inches, and height of 5 inches

(b) a rectangular prism with a length of 6 inches, width of 5 inches, and height of 5 inches

(c) a cylinder with a radius of 5 inches and a height of 6 inches



(d) a cylinder with a radius of 6 inches and a height of 5 inches