Name: KEY Pre-Algebra Period: _____ Date: _____

Review for the test on : Volume

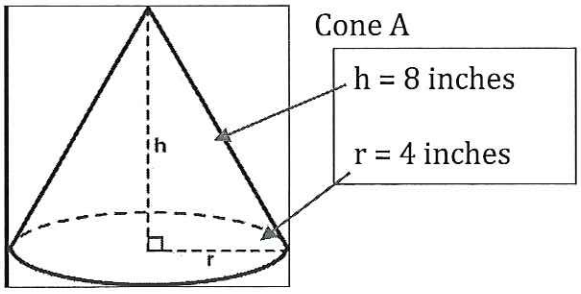
8.G.9 _____/46

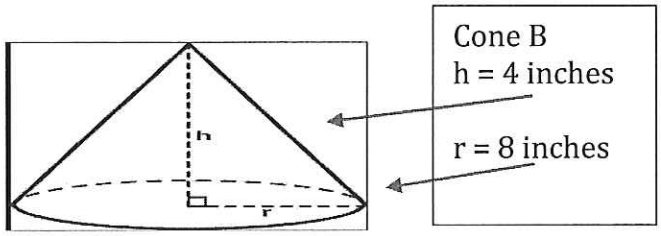
8.G.9
Formulas 1 point each

What is the formula for volume of a cylinder:	What is the formula for volume of a cone:
$V = \pi r^2 h$	$V = \frac{\pi r^2 h}{3}$
What is the formula for volume of a sphere:	**What is the formula for volume of a hemisphere:**
$V = \frac{4\pi r^3}{3}$	$V = \left(\frac{4\pi r^3}{3}\right) \div 2$

Directions: Show all work for partial credit. Round answers to the nearest hundredth when needed. Remember to label answers.

1. Melissa's soccer coach used two cones of different sizes during practice. Melissa says that the two cones have the same volume. Do you think she is correct? Explain your reasoning. Use your calculations to justify your answer. (5 pts)





melissa is not correct cone B has a greater volume. see calculations below

Cone A

$V = 3.14 \cdot (4)^2 \cdot 8$

$3.14 \cdot 16 \cdot 8$

$V = 401.92 \div 3$ in^3

$V = 133.97\ in^3$

Cone B

$V = 3.14 \cdot (8)^2 \cdot 4$

$V = 3.14 \cdot 64 \cdot 4$

$V = 803.84 \div 3$ in^3

$V = 267.95\ in^3$

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2. Sugar Plum Candy Company came up with 2 different shapes for lolly-pops. One is in a shape of a cylinder with a diameter of 3 cm and a height of 7 cm. The second one is in a shape of a cone with a radius of 4 cm and a height of 9 cm. Your Mom thinks that the cylindrical lolly-pop has more candy, where as your Dad argues that the cone has more candy since it's longer. Who is right? Explain your reasoning. Use your calculations to justify your answer. (5 pts)

Cylinder

$V = \pi r^2 h$

$V = 3.14 \cdot (1.5)^2 \cdot 7$

$V = 49.455\ cm^3$

Cone

$V = \pi r^2 h \div 3$

$V = (3.14 \cdot (4)^2 \cdot 9) \div 3$

$V = 150.72\ cm^3$

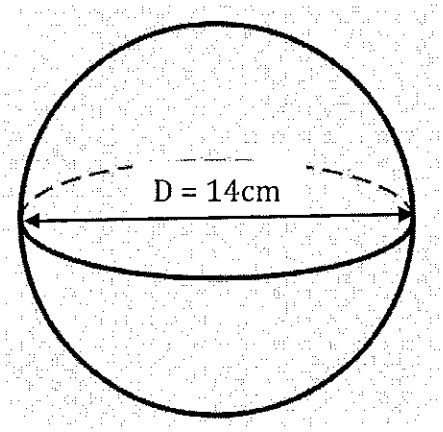
Dad is correct the volume of the cone is greater

3. Rick is asked to find the volume of a sphere with a diameter of 14 centimeters. Explain and correct all his error(s). (4 pts)

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

$= \frac{\pi(14)^2 14}{3}$

$= \frac{2744\pi}{3} = 914.7\pi$



$V = \frac{4 \cdot \pi \cdot 7^3}{3}$

$V = \frac{4 \cdot 343 \cdot \pi}{3}$

$V = 457.\overline{3}\pi\ cm^3$

or

$V = \frac{4 \cdot (3.14) \cdot r^3}{3}$

$V = \frac{4 \cdot (3.14) \cdot (7)^3}{3}$

$V = \frac{4 \cdot (3.14) \cdot 343}{3}$

$V = 1436.026\ cm^3$

First - wrong formula

Second - Rick used the diameter instead of the radius. He should have used r=7, not r=14

Third - Rick forgot units

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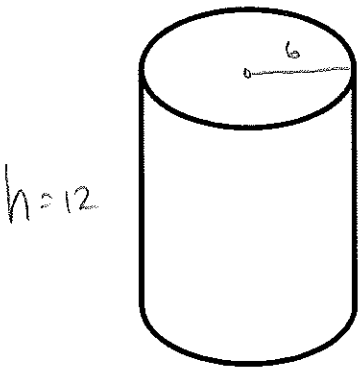
4. A Soup company makes two different cylindrical cans, each with the same volume. Can A has a height of 12 centimeters and a radius of 6 centimeters. Can B has a radius of 4 centimeters. What is the height of Can B? (4 pts)

First - find volume of A

Can A



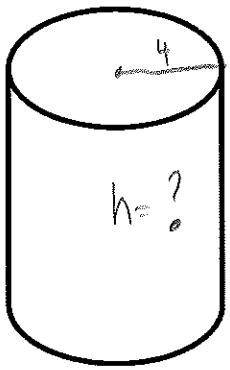
$V = \pi r^2 h$

$V = 3.14 \cdot (6^2) \cdot 12$

$V = 3.14(36)(12)$

$V = 1356.48$

Can B



$V = \pi r^2 h$

$1356.48 = 3.14(4)^2(h)$

$1356.48 = 3.14(16)h$

$1356.48 = 50.24h$

$\frac{1356.48}{50.24} = \frac{50.24h}{50.24}$

$27 = h$

CAN B is 27cm in height

5. Four identical tennis balls with an 8.42 cm diameter are stacked in a cylindrical container. Assume that the tennis ball touches the sides of the container. Calculate the volume of the cylindrical container. (4pts)

What is the height of the container? 33.68cm What is the radius of the container? 4.21

The diameter is the height of the ball

$4 \times 8.42 = 33.68$ cm

radius is $\frac{1}{2}$ the diameter $8.42 \div 2 = 4.21$

The volume of the container is $V = \pi r^2 h$

$V = 3.14 (4.21)^2 (33.68)$

$1874.415 \approx$ 1874.42 cm^3

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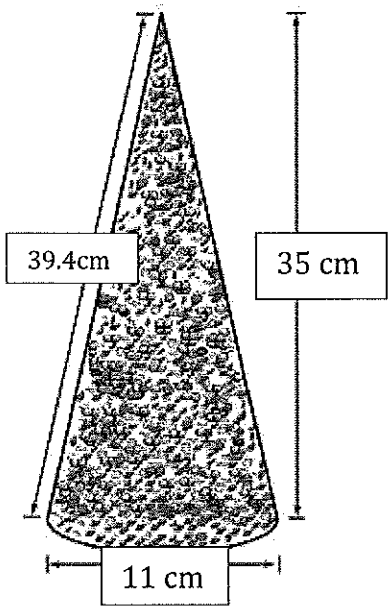
6. The Avian Club is selling cones of birdseed that can be hung outside. The birdseed weighs about 4.1 grams per cubic centimeter. (4 pts)

a. Find the volume of the cone. $V = (\pi r^2 h) \div 3$

$V = \frac{3.14(5.5)^2(35)}{3} = 1108.158$

$= 1108.16$ cubic cm



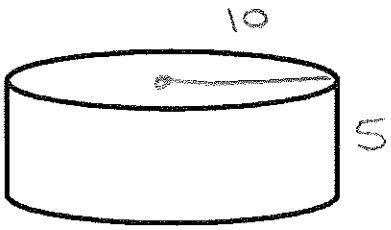
b. What is the approximate weight of one cone?

$1108.16 \times 4.1 =$

4543.456 grams

7. An above ground cylindrical swimming pool has a diameter of 20 feet and a height of 5 feet. About how many gallons of water can the pool contain? Round your answer to the nearest whole number. (1 cubic foot ≈ 7.5 gal) (4 pts)

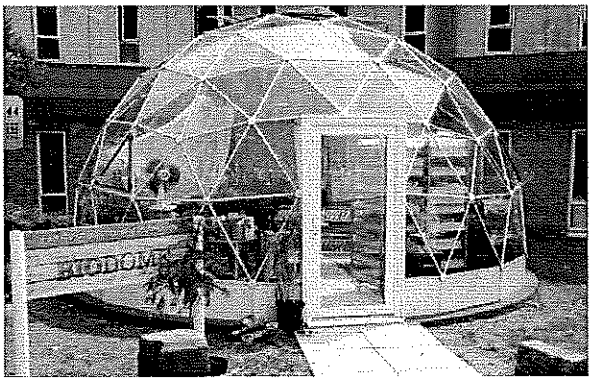
$20 \div 2 = 10$



$V = 3.14 \cdot (10)^2 \cdot 5 = 1570$ cubic FT

$1570 \times 7.5 =$ 11,775 gallons

8. This university science lab is in the shape of a hemisphere that has a radius of 15.7 feet. Find the volume of the hemisphere. (4 pts)



$V = \left(\frac{4 \cdot \pi \cdot r^3}{3}\right) \div 2$

half a sphere

$V = 4(3.14)(15.7)^3 \div 3 \div 2$

$V = 8100.98$ FT^3

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9. A Cumberland Farms has two different sizes of **cylindrical**-shaped drink cans on sale.

Mountain Dew	**Code Red**
Sale price $ 4.75	**Sale price $ 5.00**
6 cm diameter	**6 cm diameter**
15 cm tall	**17 cm tall**

a. Find the volume of each drink can. (4pts)

MD

$V = \pi r^2 h$

$V = 3.14 (3)^2 \cdot 15$

423.9

Code Red

$V = \pi r^2 h$

$V = 3.14(3)^2(17)$

485.01

b. Which drink is a better buy? Justify your reasoning with calculations. (Hint: compute unit rate) (2 pts)

$\frac{4.75}{423.9} = \$0.0112$

$\frac{5.00}{485.01}$ $0.0103

Code Red cheaper

10. Essential Question. : How can the calculations of cylinders, cones and spheres be useful to people in the real world? (2 pts)

① People need to know the volume of items in the real world such as swimming pools and soda cans. ② Volume can help us compare costs using unit rate when we are shopping and looking for the best deal

Builders and architects use volume during planning and construction.

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