

Volume Word Problem Answers and Explanations

1) A

First, let's convert the 2 gallons of orange juice into cubic inches

$$2 \times 231 = 462 \text{ cubic inches}$$

We have a maximum of 462 cubic inches that we can distribute into the cups. Now let's find out how much orange juice can fit into one cup.

$$\pi r^2 h = \text{volume of cylinder}$$

$$\pi(2)^2 7 = 28\pi \text{ in}^3$$

$$87.96 \text{ in}^3 \text{ per cup}$$

Now, we divide the 462 cubic inches of orange juice by the volume per cup

$$462 \div 87.96 = 5.25 \text{ cups}$$

Since the problem is asking for full cups, we round down to get 5 cups.

2) B

Let's set up the equation for the volume of a cylinder and input the values that we know.

$$\pi(2)^2 h = 124 \text{ cm}^3$$

Now let's solve for h

$$4\pi h = 124$$

$$h = \frac{124}{4\pi}$$

$$h = \frac{31}{\pi}$$

3) B

Set up an equation for the volume of a cylinder and input the values that we know to find the diameter.

$$\pi(r)^2 7 = 448\pi \text{ in}^3$$

$$7\pi r^2 = 448\pi$$

$$r^2 = \frac{448\pi}{7\pi}$$

$$r^2 = 64$$

If the radius is 8 inches, then the diameter is 16 inches.

4) D

With the given dimensions, each cone will have a volume of:

$$\text{volume of cone} = \pi r^2 \frac{h}{3}$$

$$\pi(4)^2 \frac{3}{3}$$

$$\text{volume of each top} = 16\pi \text{ cm}^3$$

If the wood block has a volume of 500π cubic centimeters, then we divide that number by the volume of each top to find out how many tops can be manufactured.

Volume Word Problem Answers and Explanations

$$500\pi \div 16\pi = 31.25 \text{ tops}$$

Since we can't have .25 of a top, the maximum number of tops that can be created is 31. Now we multiply the number of tops with the money each top brings in (\$2) to get \$62.

5) C

First, we must find the measurement of each side of the cube. Since a cube's sides are all the same length, we can set the expressions equal to each other.

$$2x + 8 = 5x - 4$$

Now we solve for x.

$$8 = 3x - 4$$

$$12 = 3x$$

$$4 = x$$

Plug the x-value into either one of the expressions to find the side length.

$$2(4) + 8 = 16 \text{ feet}$$

Now we simply cube 16 to find the volume of the entire cube.

$$16^3 = 4096 \text{ ft}^3$$

6) C

Let's set up the equation for the volume of a sphere and solve for the radius of the sphere.

$$121.5\pi \text{ in}^3 = \frac{4}{3}\pi r^3$$

$$\frac{3}{4\pi}(121.5\pi) = r^3$$

$$91.125 = r^3$$

$$4.5 = r$$

If the radius is 4.5 inches, then the diameter of each basketball is 9 inches.

$$9 \times 40 = 360 \text{ inches}$$

Notice how the answer choices are all in feet, so we must convert inches to feet.

$$360 \div 12 = 30 \text{ feet}$$

7) D

To answer this question, we must find out what the height of the dough before baking is. We know that the length and width of the dough is already predetermined. We can use those values to find the missing value of the dough height.

$$15 \times 5 \times h = 450$$

$$h = 6$$

The height of the dough before baking is 6 inches which means it is only 1 inch away from the top of the pan which has a height of 7 inches.

8) A

Simply plug in the dimensions into the cone volume formula

Volume Word Problem Answers and Explanations

$$\frac{1}{3}\pi(3)^2 8 = 24\pi \text{ in}^3$$

9) A

The formula for rectangular pyramids is as follows:

$$\text{volume for rectangular pyramid} = \frac{lwh}{3}$$

If we plug in the dimensions for the model pyramid we get:

$$\frac{(50)(50)(75)}{3} = 62,500 \text{ in}^3$$

10) D

First let's find the volume of the hole inside the wheel.

$$\pi(0.5)^2 0.5 = 0.125\pi$$

Next, let's find the volume of the entire wheel including the hole.

$$\pi(1.5)^2 0.5 = 1.125\pi$$

Now, subtract the hole from the entire volume to find the volume of just the wheel.

$$1.125\pi - 0.125\pi = \pi \text{ in}^3$$