

How many boxes of Jello?

Common Core Standards :

Quantities N -Q

Reason quantitatively and use units to solve problems.

1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

Geometric Measurement and Dimension G-GMD

Explain volume formulas and use them to solve problems

1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*

3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

Modeling with Geometry G-MG

Apply geometric concepts in modeling situations

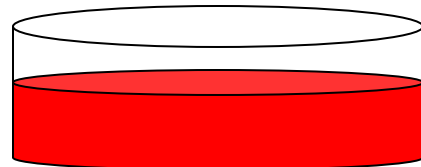
1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

Problem: I want to Jell-O wrestle some of my friends in my back yard. I have a swimming pool that has a diameter of 8 feet. The pool is 3 feet high but I only want to fill it up with 2 feet of Jell-O. I know that each box of Jell-O makes two cups of Jell-O. How many boxes will it take?

Extension: Where can I make all of the Jell-O? How much will it cost? What is the surface tension of a square inch of Jell-O?

Solution:

This is a cylinder we first need to find the volume. $V = \pi r^2 h$, $V = \pi \times 4^2 \times 2$; this will give you a volume of 100.5 ft^3 . Jell-O is not sold by the cubic foot so you have to convert cubic feet into gallons. $1 \text{ ft}^3 = 7.48$ gallons. Multiply 100.5 ft^3 by 7.48 gallons. This will give you 751.74 gallons. Each box of Jell-O makes two cup. There are 16 cups in one gallon. Multiply 751.74 gallons by 16 cups. This gives you 12027.84 cups. Now divide by two since there are two cups in each box. You will get 6013.92 boxes. Since you can't buy part of a box of Jell-O, you will need 6014 boxes.



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Hot Air

Common Core Standards :

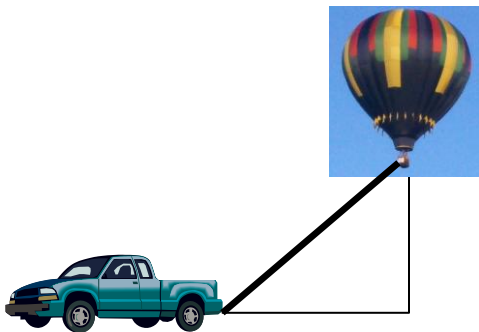
Trigonometric Functions F-TF

Model periodic phenomena with trigonometric functions7. (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.

Problem: A hot air balloon is being tethered to truck with 100 feet of rope. The truck bed is 4 feet from the ground and the angle of elevation from the truck bed to the balloon is 27° . How far up in the air is the balloon?



Solution: Use the sine function to find how long far up the balloon is from the ground.



$$\sin 27^\circ = x/100$$

$x = 45.4$ ft but we have to add on distance from the truck bed to the ground. The answer will be 49.4 ft.

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