

Solutions

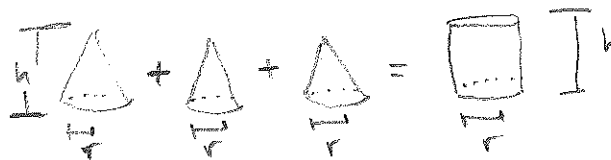
Mr. Mahjedin

GMD-1a

Practice Assessment

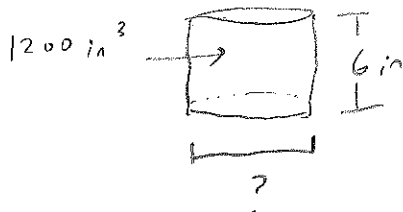
1. Explain in words why the volume of a **CONE** is equal to $\frac{1}{3} * \pi * \text{radius}^2 * \text{height}$. You may draw pictures to accompany your written answer.

Well, a cylinder's volume is $\pi \cdot r^2 \cdot h$. And as long as the base radius and height remain constant, the cone with the same radius and height will have one-third of the cylinder's.



GMD-3A

2. To the nearest tenth, find the diameter of a 6-inch tall cylinder that has a volume of 1200 cubic inches.



$$V = \pi \cdot r^2 \cdot h$$

Have: $V = 1200$ $\pi \approx 3.14$
 $h = 6$

Need: radius (thus, diameter)

$$1200 = 3.14 \cdot r^2 \cdot 6$$

$$\frac{1200}{18.84} = \frac{18.84}{18.84} r^2$$

Divide

$$\sqrt{63.69} = \sqrt{r^2}$$

Square root

$$7.98 = r$$

thus, diameter = $7.98 \times 2 = 15.96$ in

MG1a

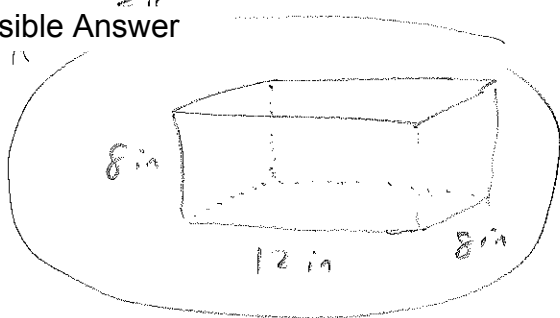
3. Fish are being placed in an aquarium. Each fish of this particular species needs approximately 160 in³ per fish in order to have enough room to breathe, feed, and live comfortably. If you want to place 4 of these fish in an aquarium, sketch out the dimensions of a suitable, reasonably sized aquarium with less than 1000 in³ total volume.

$$4 \text{ fish} \times \frac{160 \text{ in}^3}{\text{fish}} = 640 \text{ in}^3 \text{ needed for 4 fish}$$

Aquarium shape... How 'bout a prism or box?

Needs at least 640 volume but less than 1000 in³.

1 Possible Answer



TIP: use trial and error until you find dimensions that work!

$$V = 12 \times 8 \times 8 = 768 \text{ in}^3$$

fits between 640 and 1000! yay!

So: radius = 4cm

MG2a

Sphere

4. A strange rock has appeared at your lab and you want to determine its origin. It closely resembles a large marble or bouncy ball and has a 8 cm diameter. A scale shows it has a mass of 435 grams. The table below shows average densities of rocks based on their origin. Where did the rock most likely originate? Show the calculations that lead to your conclusion.

Origin	Density (g/cm ³)
Surface	1.99
Continental Shelf	2.57
Ocean floor	3.48
Volcanic	1.62

Density = $\frac{\text{mass} \leftarrow \text{known}}{\text{Volume} \leftarrow \text{can find.}}$

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

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

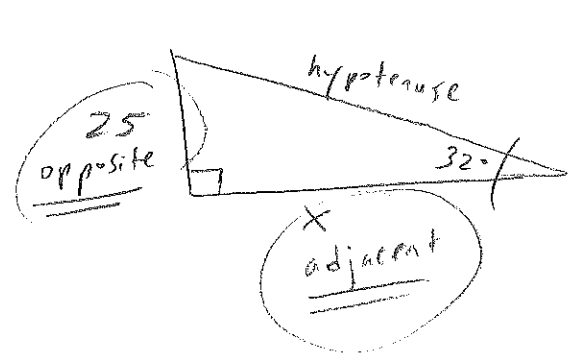
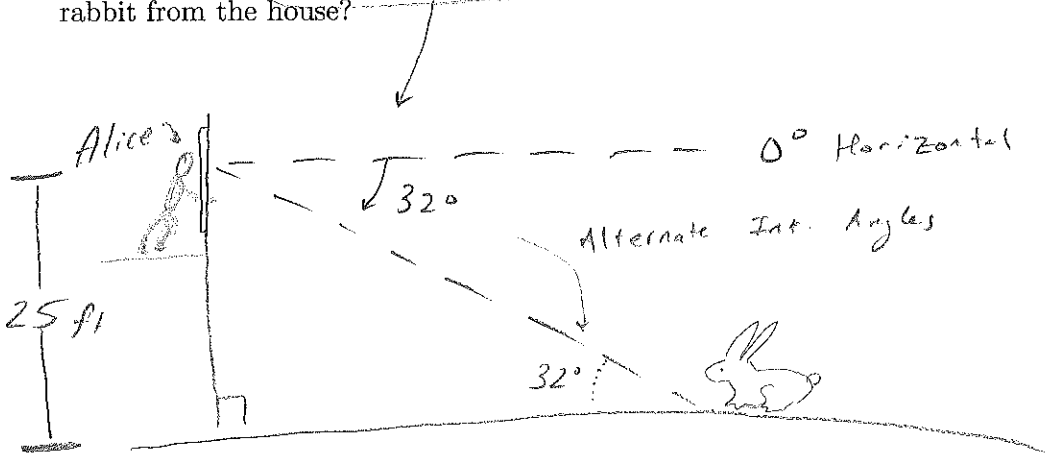
$V = 267.9 \text{ cm}^3$

Density = $\frac{\text{mass}}{\text{volume}} = \frac{435 \text{ g}}{267.9 \text{ cm}^3}$
 = 1.62 g/cm³ } divide

Now check table: So... Volcanic rock!

SRT-C8a

5. From the window of her upstairs bedroom 25 feet above the ground, Alice spots a cute baby rabbit in the yard below. The angle of depression from Alice to the rabbit is 32°. How far along the ground is the rabbit from the house?



SOH CAHTOA
 Have need.

$\tan 32 = \frac{25 \text{ opp}}{x \text{ adj}}$
 ↓ calc.

$0.625 = \frac{25}{x}$

put over,
 cross multiply

$0.625 \cdot x = 25$

Divide

$\frac{0.625x}{0.625} = \frac{25}{0.625}$

40 feet

$x = 40$