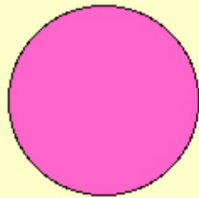


Video HW



Assessment:

Will need to explain
one or more of these
formulas:

- circumference
- circle area
- volume of cylinder
- volume of cone
- volume of pyramid

Take notes

"Explaining Volumes of Cylinders and Cones"

"Explaining Volumes of Cylinders and Cones"

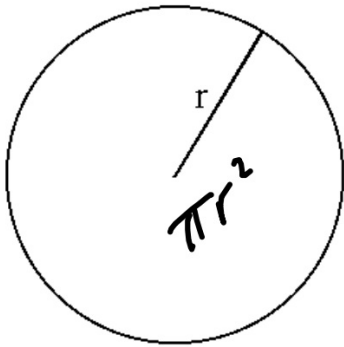


What do you notice?

What do you wonder?

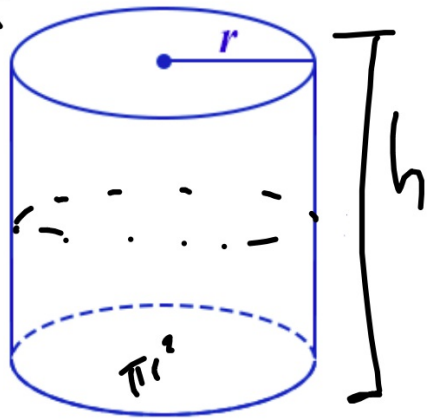
Why is a cylinder volume $\pi \cdot r^2 \cdot h$?

"a stack of h circles, πr^2 "



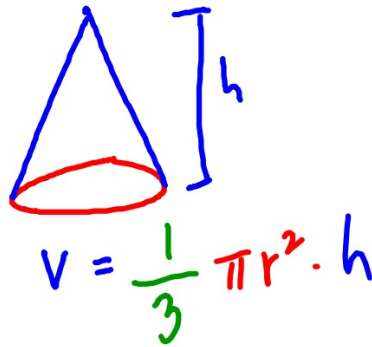
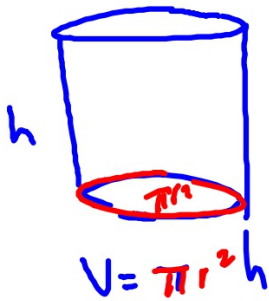
2D

new dimension



3D

How many times will the cone need to be poured to fill the cylinder with the same base and height?



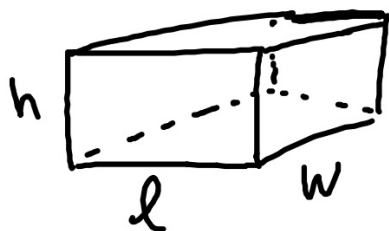
https://www.youtube.com/watch?v=QnVr_x7c79w

<https://www.youtube.com/watch?v=9fUmkZuaRQM>

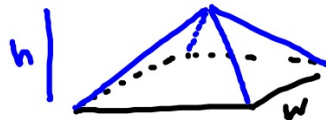
pyramid:

<https://www.youtube.com/watch?v=OUDjY6vJ8pw>

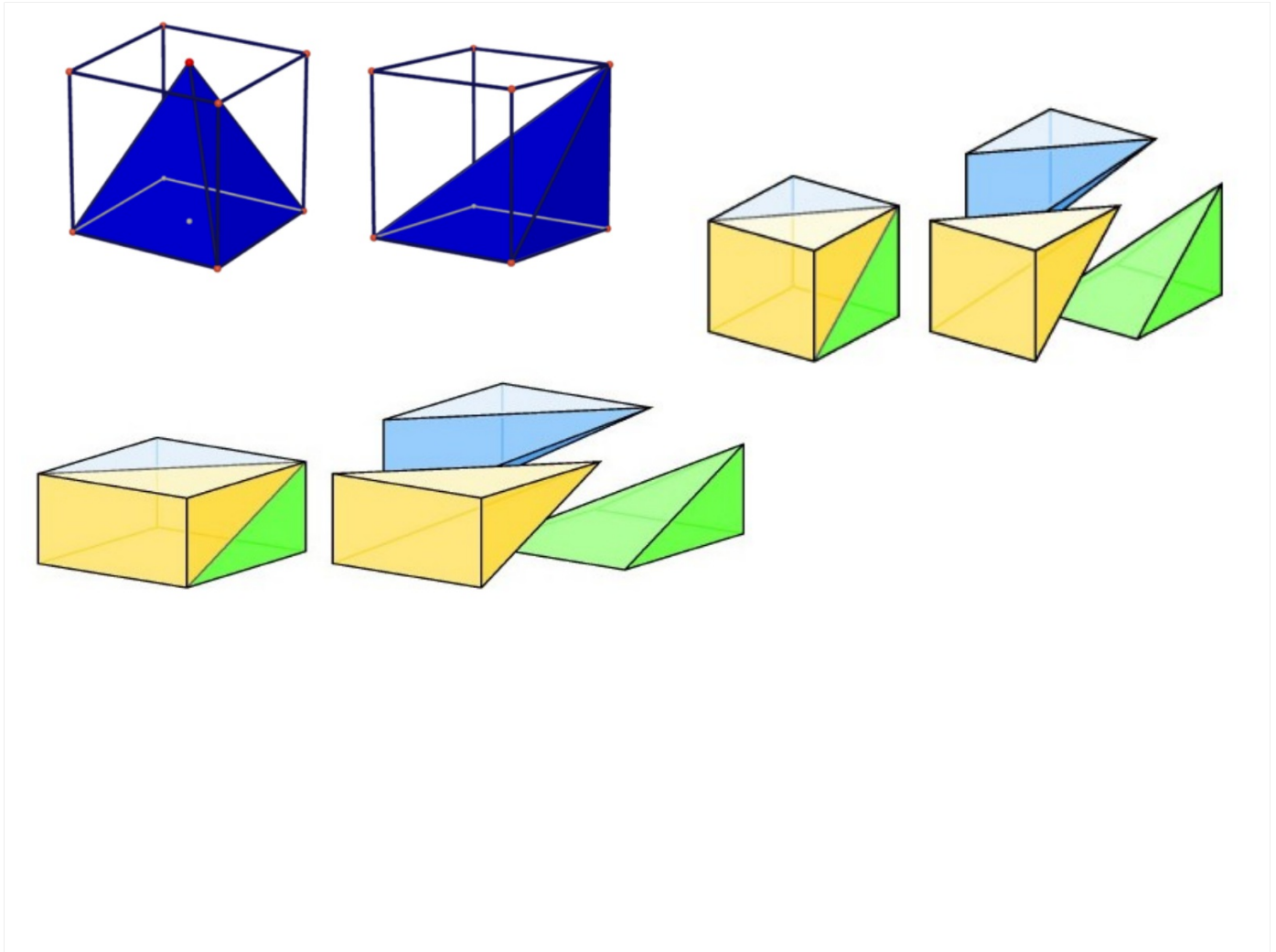
How much of a box is a pyramid?



$$V = l \cdot w \cdot h$$



$$V = \frac{1}{3} l \cdot w \cdot h$$



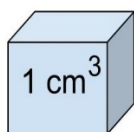
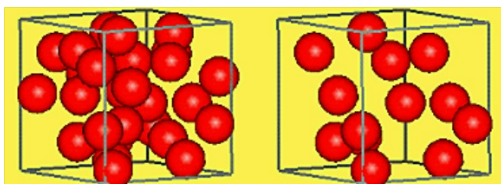
Why is the volume of a cone $\frac{1}{3} \pi r^2 h$?

Why is the volume of a pyramid $\frac{1}{3} l w h$?

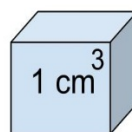
Density and Volume

What is density? $D = \frac{\text{mass}}{\text{volume}}$

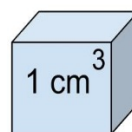
amount of stuff per space unit.



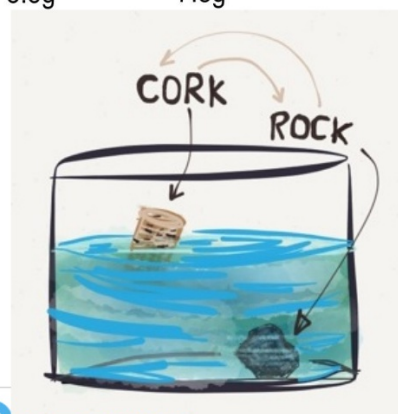
Foam
0.03g



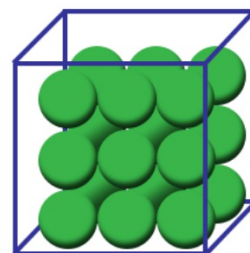
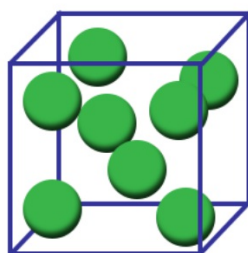
Diamond
3.5g



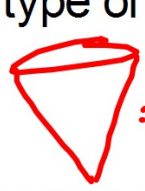
Iron
7.8g



Density



A small bit of a heavy rock has broken off. The piece is in the shape of a cone and measures 3 cm long and is 3 cm wide at its base. Placed on a scale, the mass is determined to be 14.8 grams. What type of rock is it most likely, based on the table below?



$$V = \frac{1}{3} \cdot \pi (1.5)^2 \cdot 3$$

$$D = \frac{m}{V}$$

$$= \frac{14.8 \text{ g}}{7.1 \text{ cm}^3}$$

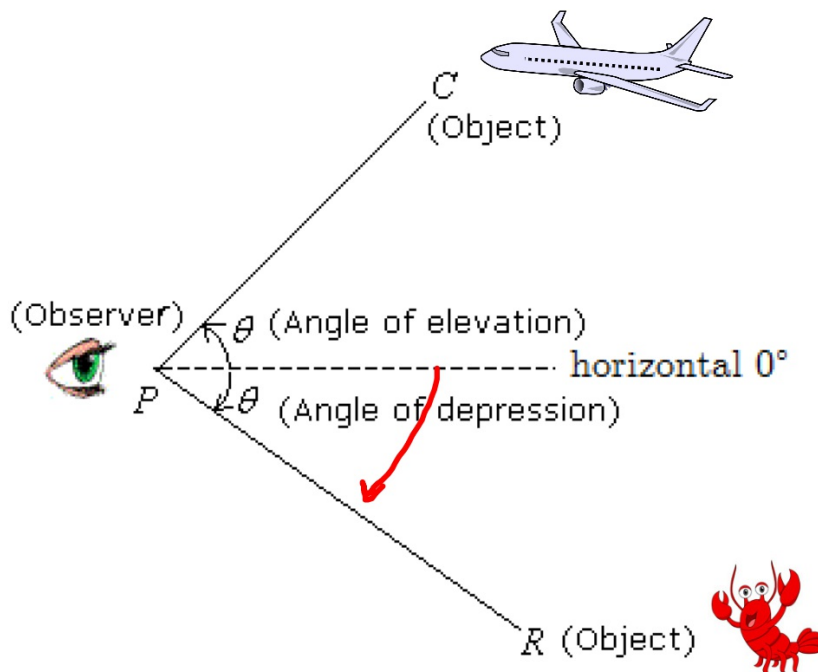
$$2.1 \text{ cm}^3$$

Type	Density (g/cm ³)
Shale	0.5
Granite	3.7
Sandstone	2.1
Diamond	4.8

(note, these densities are made-up
I couldn't find the real ones easily)

Angle of Elevation/Depression

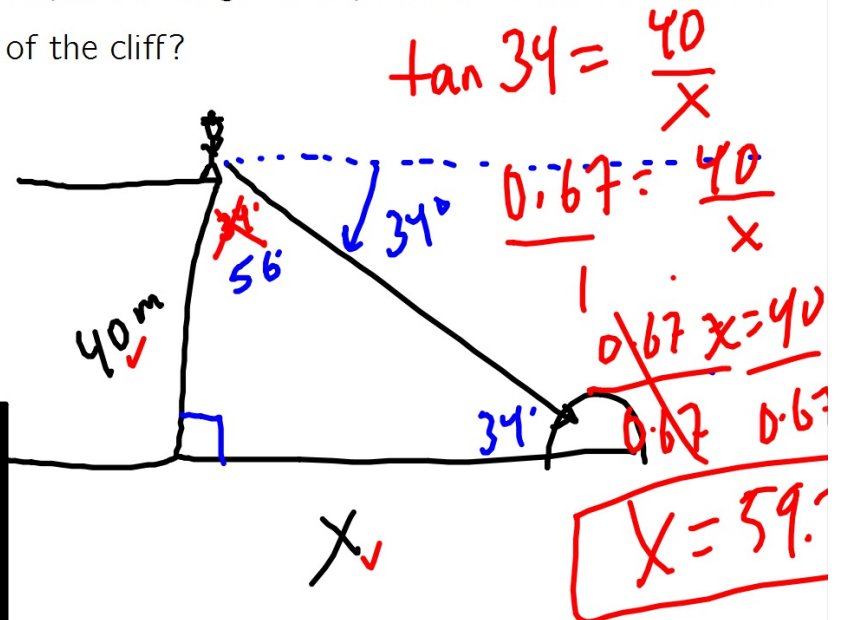
amount of "tilt" above and below the horizontal 0°



Easy example

6. From the top of a vertical cliff 40 m high, an engineer spots a large rock on the valley floor below through her scope. The angle of depression to the rock is 34° . How far is the rock from the base of the cliff?

- Draw a picture
- Private Think Time
- Turn and Talk



Angle of Elevation

1.

Hard Example

4. From a plane flying due east at 265 m above sea level, the angles of depression of two ships sailing due east measure 35° and 25° . How far apart are the ships?

Challenge Problem

Two buildings, headquarters of Alice-Corp and Bob-Company, are located 35 meters apart. From atop Alice Corp's building, the angle of elevation to the top of Bob's building is 24° and an angle of depression down to the bottom is 34° .

How tall is each building?

