

Good morning: no warm up, we will randomize and begin our new unit on area, volume, surfaces, density, and problem solving

Retakes available in every DS but Wednesdays...ask for a pass!  
Tutoring/retakes 4-5pm today

What are the first questions that come to mind?

<http://www.101qs.com/136-you-pour-i-choose>

What are the first questions that come to mind?



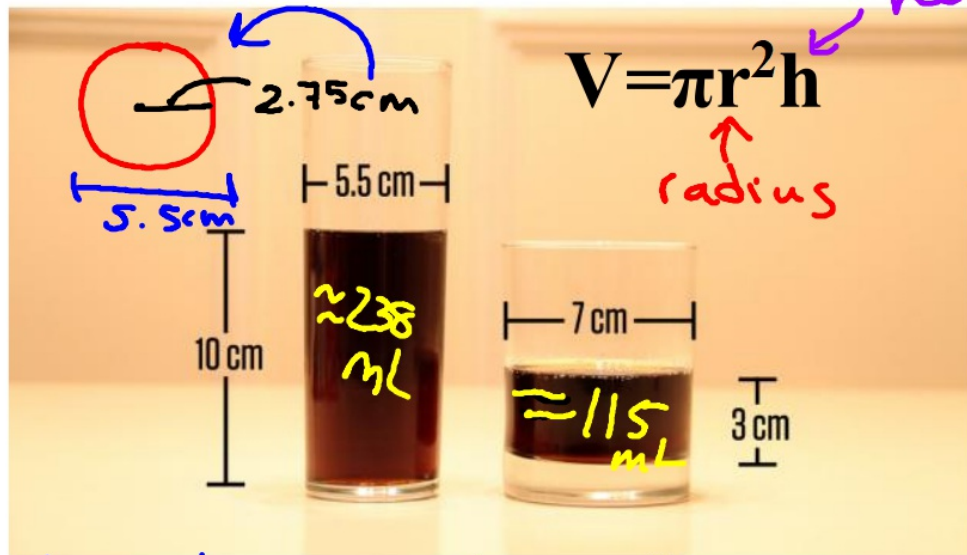
Write down your guess: which glass holds more soda?



What information do you need to answer this question?



Which one holds more soda?



1 mL = 1 cm<sup>3</sup>



## Standards we will be covering

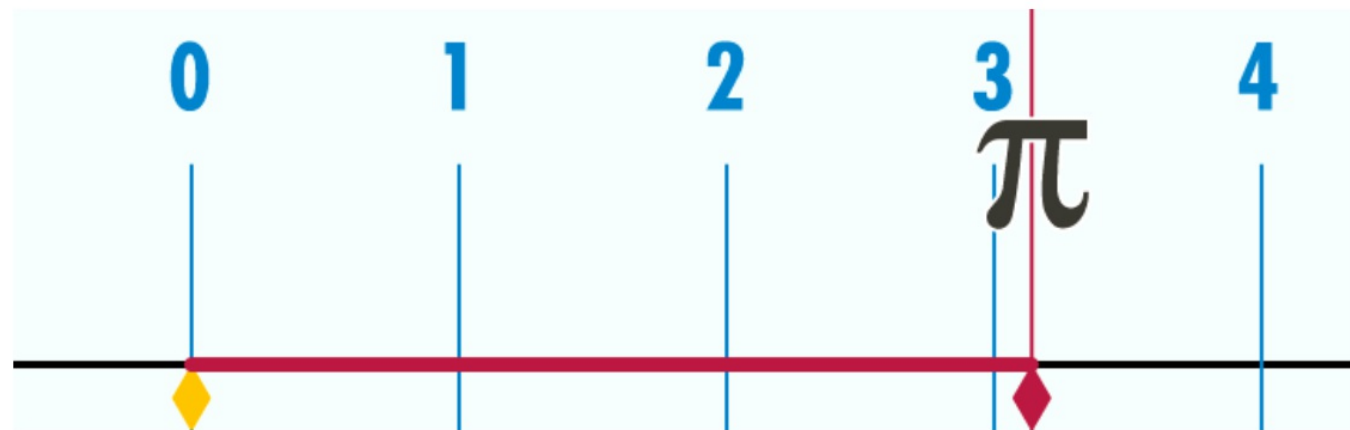
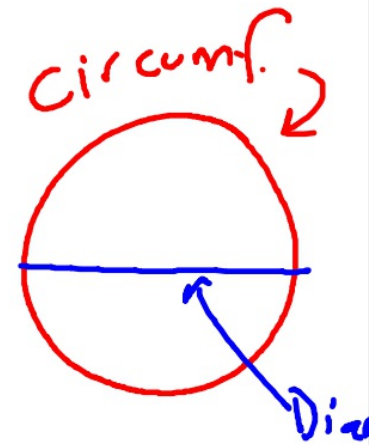
<b>A. Explain volume and surface area formulas and use them to solve problems.</b>	<b>G.GMD.A.1</b> Give an informal argument for the formulas for the circumference of a circle and the volume and surface area of a cylinder, cone, prism, and pyramid.
	<b>G.GMD.A.2</b> Know and use volume and surface area formulas for cylinders, cones, prisms, pyramids, and spheres to solve problems. ★

Why is the circumference of a circle  $2\pi r$  ?

Why is the area of a circle  $\pi r^2$  ?

What is  $\pi$ ?

$$\pi = \frac{\text{circumference}}{\text{diameter}}$$





Circumf.



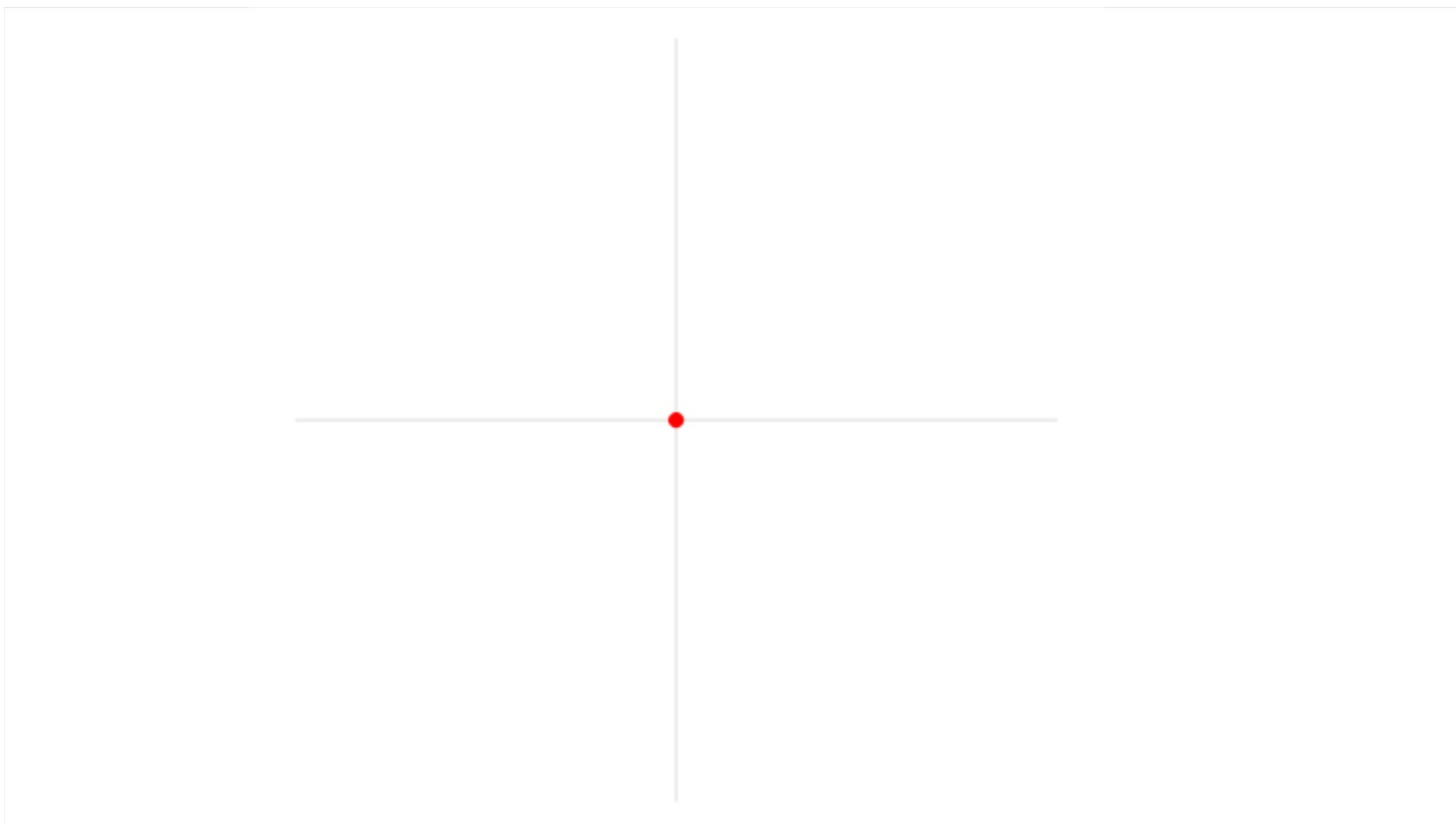
$\pi = \frac{\text{circumference}}$

~~diameter~~  $2 \cdot r$

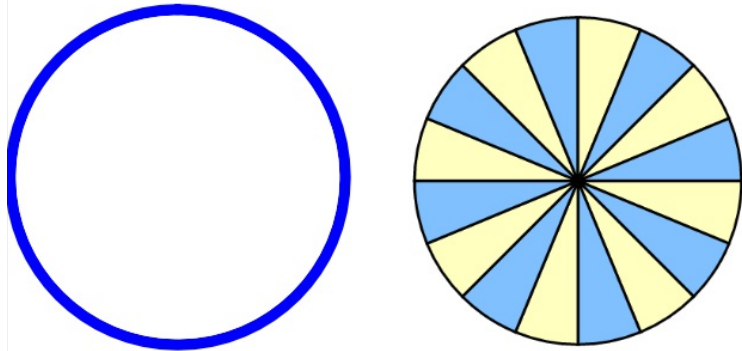
$$2r \times \pi = \frac{C}{2r} \times 2r$$

$$\underline{2\pi \cdot r = C}$$

$$C = 2\pi r$$



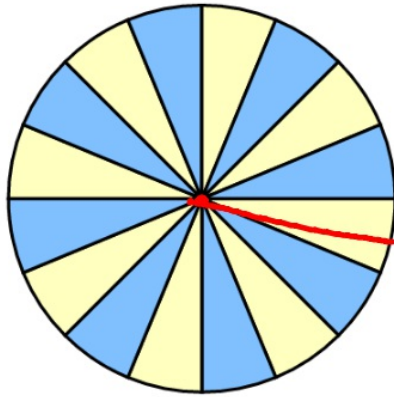
Okay...but area??  $\pi r^2$  ??



$$A_0 = \pi r^2$$

<https://www.youtube.com/watch?v=YokKp3pwVFc>

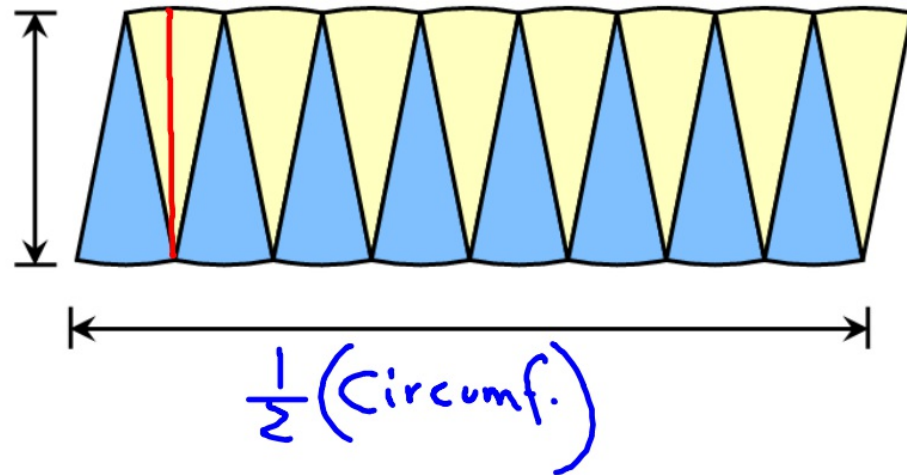
<https://www.youtube.com/watch?v=lZa312pEcTw>



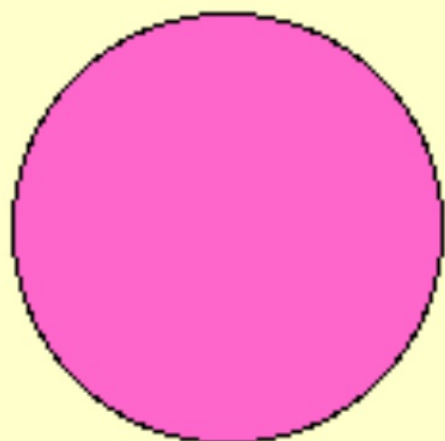
$$A = b \cdot h$$

$$A = \frac{1}{2} \cdot 2\pi r \cdot r$$

$$\underline{A = \pi r^2}$$



<https://www.geogebra.org/m/awBAYg6P>



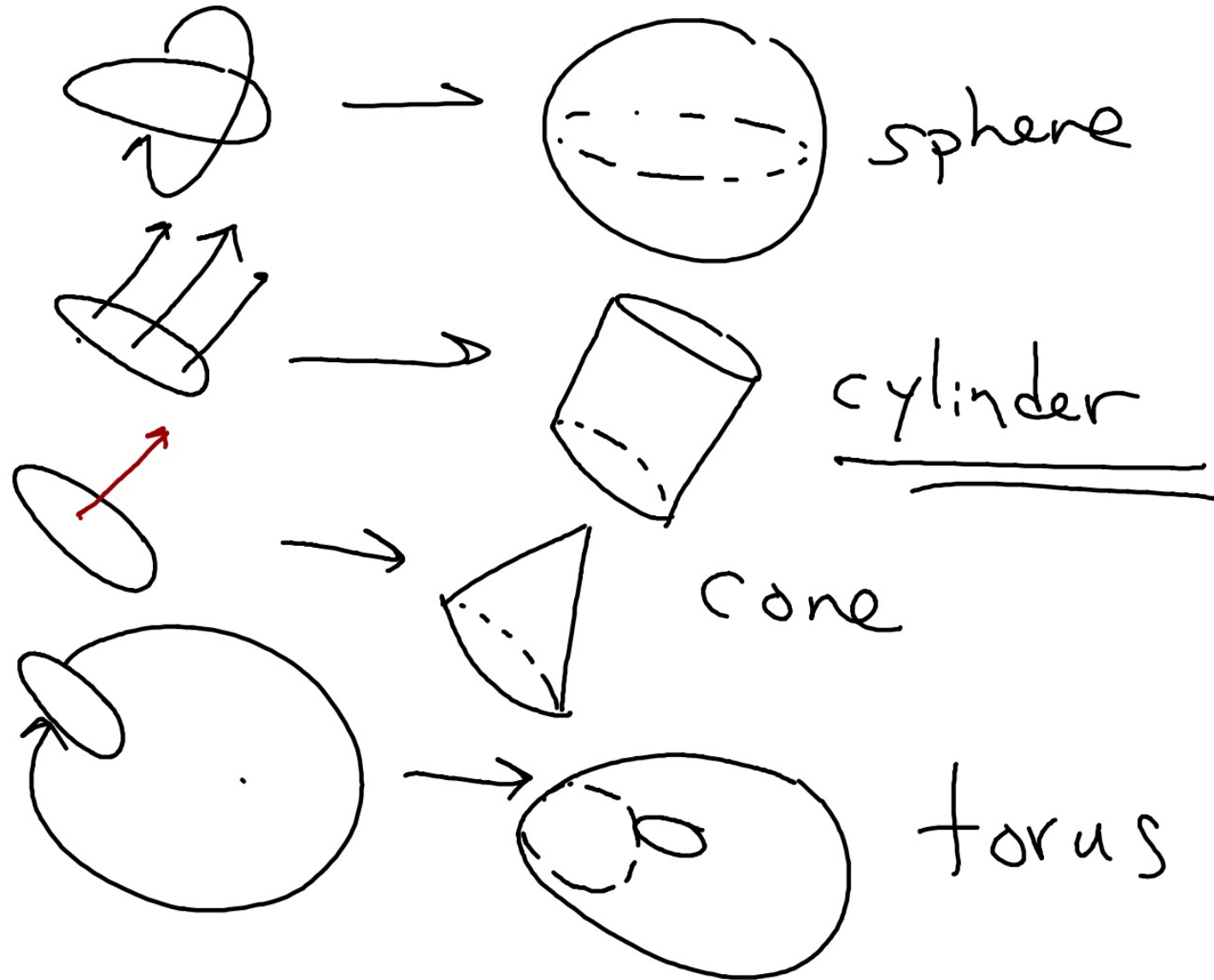
Another approach....





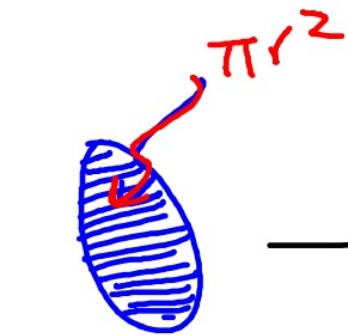
<https://www.youtube.com/watch?v=whYqhpc6S6g>

A circle can spawn many 3D shapes when extruded

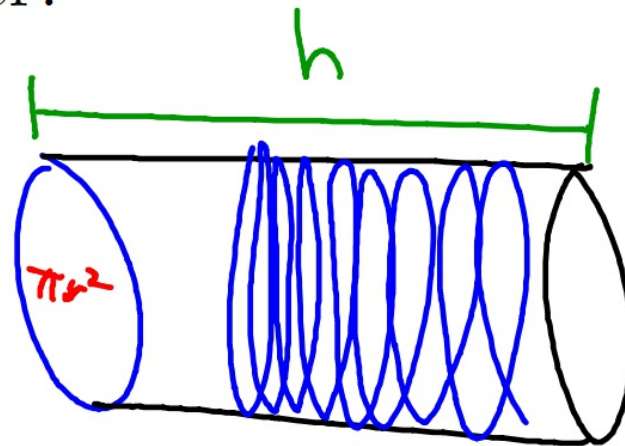




What IS a cylinder?



Circle



Cylinder

cylinder:  
stack  
of  
circles

space of  
1 circle

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

# of circles  
in the stack

What are the first questions that come to mind?

<http://www.101qs.com/868-popcorn-picker>

What are the first questions that come to mind?



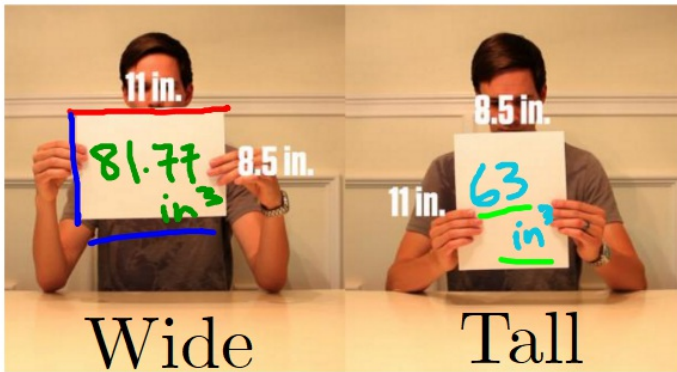
Which one holds more popcorn? Write down your guess



Wide

Tall

Which one holds more popcorn?



(W)

Diagram of a wide cylinder with height 8.5 in. and circumference 11 in. The radius is labeled as 1.75 in.

$$C = 11 = \frac{2\pi r}{2\pi}$$

$$1.75 = r$$

$$V = \pi (1.75)^2 \cdot 8.5 = \underline{81.77}$$

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

$$C = 2\pi r$$

(T)

Diagram of a tall cylinder with height 11 in. and radius 1.35 in.

$$C = 2\pi r$$

$$8.5 = 2\pi r$$

$$\frac{8.5}{2\pi} = r$$

$$1.35 \approx r$$

$$V = \pi (1.35)^2 \cdot 11$$

$$V \approx \underline{63 \text{ in}^3}$$



Homework:

p 475 #1-6, 11

continue studying formulas: [bit.ly/formulas18](http://bit.ly/formulas18)