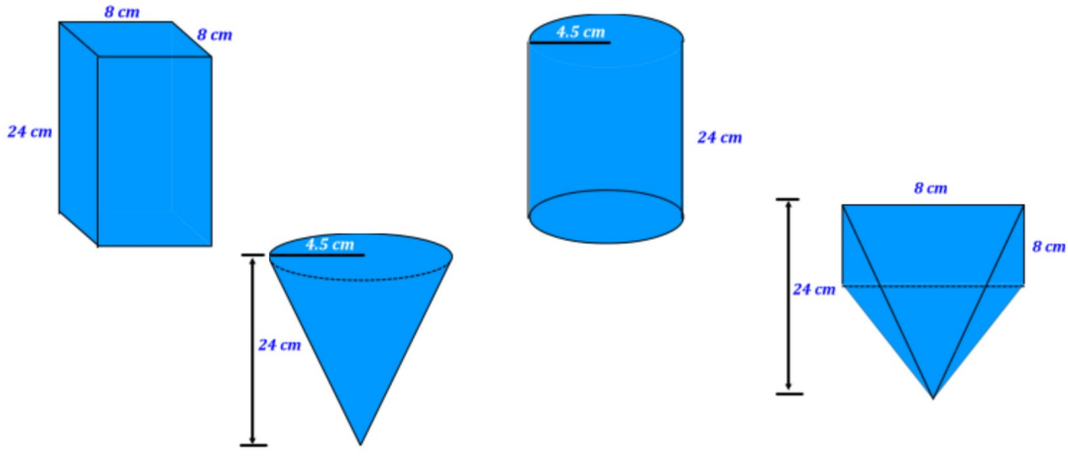
MTH1W Grade 9 Mathematics

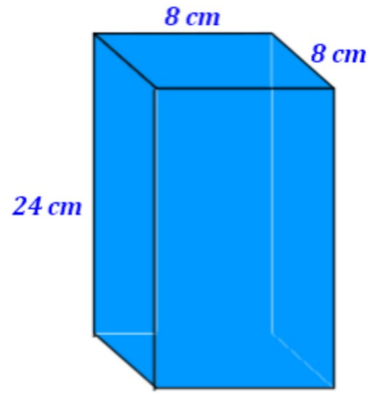
6.5 Volume Relationships

Goal(s) *- To investigate the relationship between the volume of a prism and a pyramid and a cylinder and a cone, making connections to their respective formulas*

Jun 19-8:29 AM

I like popcorn. At the local movie theatre I have four differently shaped containers of popcorn to choose from. Which of the containers pictured below should I choose? Show your reasoning.

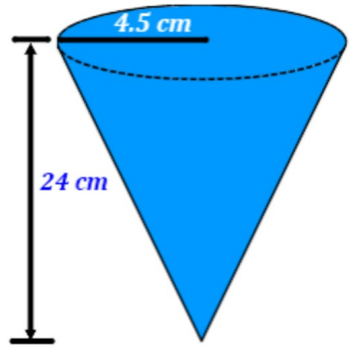




$Vol = L \times w \times h$

$Vol = 8 \times 8 \times 24$

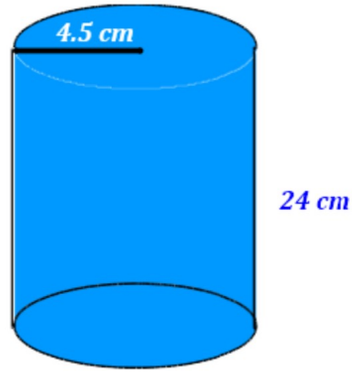
$Vol = 1536\ cm^3$



$Vol = \frac{1}{3}\pi r^2 h$

$Vol = \frac{(\pi)(4.5)^2(24)}{3}$

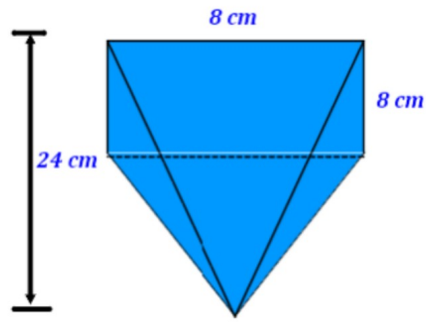
$Vol = 508.94\ cm^3$



$Vol = \pi r^2 h$

$Vol = \pi(4.5)^2(24)$

$Vol = 1526.8\ cm^3$

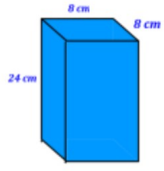


$Vol = \frac{1}{3}(\text{Base area})(h)$

$Vol = \frac{(8 \times 8)(24)}{3}$

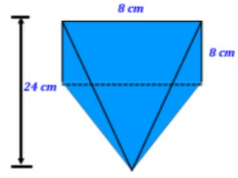
$Vol = 512\ cm^3$

What do you know notice about the volumes? Is there any connection between shapes, volumes, and formulas used?



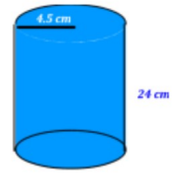
$V = 1536\ cm^3$

$V = b^2 \times h$



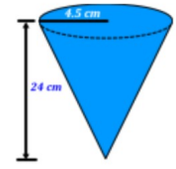
$V = 512\ cm^3$

$V = \frac{b^2 \times h}{3}$



$V = 1527\ cm^3$

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



$V = 509\ cm^3$

$V = \frac{\pi r^2 \times h}{3}$

If a **prism** and a **pyramid** have the ***same base*** and the ***same height***, the **volume of the pyramid is 1/3 the volume of the prism**.

If a **cylinder** and a **cone** have the ***same base*** and the ***same height***, the **volume of the cone will be 1/3 the volume of the cylinder**.