TSC LEARNING COMMONS

Finding the volume of Composite Figures

Many structures have been created by combining two or more basic shapes. We need to be able to separate them to calculate the total volume in each shape. This handout will explore a few of those.

Example 1:



Top: $V = \frac{1}{2}bhl = \frac{1}{2}(6 cm)(h)(20cm)$; we will need to calculate the height to complete the formula.



To find the height, we need to use the formula: $a^2 + b^2 = c^2$

$$(3)^{2} + b^{2} = (5)^{2}$$

 $9 + b^{2} = 25$
 $b^{2} = 16$
 $b = 4$

Thus, the Volume of the top piece is: $\frac{1}{2}(6 cm)(4 cm)(20cm) = 240 cm^3$ **Bottom**: $V = lwh = (20cm)(6 cm)(10cm) = 1200cm^3$ So total Volume = 240 cm³ + 1200cm³ = 1440 cm³.



Example 2: One of our favorites: an ice cream cone that is full and has a nice amount on top. This is a great example of a composite figure. The radius is 4 cm and the height of the cone is 6 cm.



Now that we can see the pieces, we can get the formulas for the volume for each piece.



You Try: Find the volume of the figure shown to the right.

Total Volume = top + bottom

$$= \frac{1}{3}\pi r^2 h_1 + \pi r^2 h_2$$

$$= \frac{1}{3}\pi (10m)^2 (7.5) + \pi (10m)^2 (2.5m)$$

$$= 250\pi + 250\pi$$

$$= 500\pi \text{ or } 1570 \text{ m}^3$$

