9.4 Volume
Volume

- Volume is the measure of the capacity of a figure.

- You will need to know the formulas on the following page.
# Formulas

<table>
<thead>
<tr>
<th>Figure</th>
<th>Formula</th>
<th>Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangular Solid</td>
<td>$V = lwh$</td>
<td><img src="image" alt="Rectangle" /></td>
</tr>
<tr>
<td>Cube</td>
<td>$V = s^3$</td>
<td><img src="image" alt="Cube" /></td>
</tr>
<tr>
<td>Cylinder</td>
<td>$V = \pi r^2 h$</td>
<td><img src="image" alt="Cylinder" /></td>
</tr>
<tr>
<td>Cone</td>
<td>$V = \frac{1}{3} \pi r^2 h$</td>
<td><img src="image" alt="Cone" /></td>
</tr>
<tr>
<td>Sphere</td>
<td>$V = \frac{4}{3} \pi r^3$</td>
<td><img src="image" alt="Sphere" /></td>
</tr>
</tbody>
</table>
Example

- Mr. Stoller needs to order potting soil for his horticulture class. The class is going to plant seeds in rectangular planters that are 12 inches long, 8 inches wide and 3 inches deep. If the class is going to fill 500 planters, how many cubic inches of soil are needed?
Example continued

- We need to find the volume of one planter.
  \[ V = lwh \]
  \[ V = 12(8)(3) \]
  \[ V = 288 \text{ in.}^3 \]

- Soil for 500 planters would be
  - \[ 500(288) = 144,000 \text{ cubic inches} \]

- There are 1728 cubic inches in 1 cubic foot \((12 \times 12 \times 12 = 1728)\)
  \[ \frac{144,000}{1728} = 83.33 \text{ ft}^3 \]
Polyhedron

Omit this
Examples from Text

- You should study the following:

Examples 1, 2, and 7 from Section 9.4

Also do problems 7-12, 21-24, p. 515 of text
Euler’s Polyhedron Formula

Omit this
Volume of a Prism

- Omit this
Volume of a Pyramid

Omit this