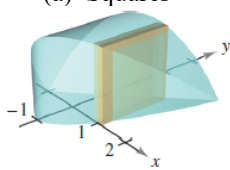
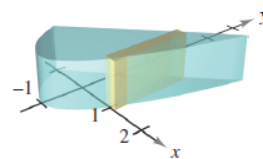


# Unit 7 Outline – Volume

<b>Monday 12/2</b>	<b>Today's Topic: Volumes by Cross Sections</b> - $V = \int_a^b$ Area of Cross Sections
<p><b>In-Class Examples:</b></p> <p>Ex. 1 <b>*Calculator Required*</b> Let <math>R</math> be the region in the first quadrant bounded by the graphs of <math>f(x) = \sin x</math> and <math>g(x) = x^2 - 2x + 1</math>.</p> <p>(a) Find the area of region <math>R</math>.</p> <p>(b) Region <math>R</math> forms the base of a solid whose cross-sections are squares taken perpendicular to the <math>x</math>-axis. Find the volume of this solid.</p> <p>Ex. 2 Let <math>R</math> be the region bounded by the graphs of <math>y = x + 1</math> and <math>y = x^2 - 1</math>. Find the volume of the solid whose base is the region <math>R</math>, with the indicated cross sections taken perpendicular to the <math>x</math>-axis:</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>(a) Squares</p>  </div> <div style="text-align: center;"> <p>(b) Rectangles of height 1</p>  </div> <div style="text-align: center;"> <p>(c) Semicircles</p> </div> </div>	
<b>Homework:</b> Worksheet 59	

<b>Tuesday 12/3</b>	<b>Today's Topic Volumes by Cross Sections</b> - $V = \int_a^b$ Area of Cross Sections
<p><b>In-Class Examples:</b> Find the volume of the solid whose base is the region in the first quadrant bounded by the graphs of <math>y = x^2</math>, <math>y = 1</math> and the <math>y</math>-axis with the indicated cross sections taken perpendicular to the <math>x</math>-axis:</p> <p style="text-align: center;">(a) Squares                      (b) Semicircles                      (c) Equilateral Triangles</p>	
<b>Homework:</b> Worksheet 60	

<b>Wednesday 12/4</b>	<b>Today's Topic: Volumes of Solids Formed by Rotation (Disks and Washers)</b>
<p><b>Review:</b> Let <math>R</math> be the region enclosed by the graphs of <math>y = \sqrt{x}</math>, <math>y = 0</math>, and <math>x = 4</math>.</p> <p>(a) Find the area of region <math>R</math>.</p> <p>(b) Region <math>R</math> forms the base of a solid. Cross-sections of this solid, taken perpendicular to the <math>x</math>-axis are squares. Find the volume of this solid.</p>	
<p><b>In-Class Examples:</b> Ex. 1 Let <math>R</math> be the region enclosed by the graphs of <math>y = \sqrt{x}</math>, <math>y = 0</math>, and <math>x = 4</math>. Find the volume of the solid generated by revolving the region <math>R</math> about the <math>x</math>-axis.</p> <p>Ex. 2 Let <math>R</math> be the region enclosed by the graphs of <math>y = \sqrt{x}</math>, <math>y = 0</math>, and <math>x = 4</math>. Find the volume of the solid generated by revolving the region <math>R</math> about the horizontal line <math>y = -3</math>.</p> <p>Ex. 3 Let <math>R</math> be the region enclosed by the graphs of <math>y = \sqrt{x}</math>, <math>y = 0</math>, and <math>x = 4</math>. Find the volume of the solid generated by revolving the region <math>R</math> about the horizontal line <math>y = 2</math>.</p>	
<b>Homework:</b> None	

<b>Thursday 12/5</b>	<b>Today's Topic: Volumes of Solids Formed by Rotation (Disks and Washers)</b>
<b>In-Class Examples:</b> None	
<b>Homework:</b> Worksheet 61	

<b>Friday 12/6</b>	<b>Today's Topic: Volumes of Solids Formed by Rotation (Disks and Washers)</b>
<b>In-Class Examples:</b> <b>Ex. 1</b> Let $R$ be the region enclosed by the graphs of $y = \sqrt{x}$ , $y = 2$ , and the $y$ -axis. Find the volume of the solid generated by revolving the region $R$ about the $y$ -axis.	
<b>Ex. 2</b> Let $R$ be the region enclosed by the graphs of $y = x^2$ and $y = 4$ . Find the volume of the solid generated by revolving the region $R$ about the line $x = -2$ .	
<b>Homework:</b> Worksheet 62	

<b>Monday 12/9</b>	<b>Today's Topic: Area and Volume Review</b>
<b>In-Class Examples:</b> None	
<b>Homework:</b> Worksheet 63	

<b>Tuesday 12/10</b>	<b>Today's Topic: Area and Volume – AP Questions</b>
<b>In-Class Examples:</b> Let $R$ and $S$ be the regions in the first quadrant shown in the figure at right. The region $R$ is bounded by the $x$ -axis and the graphs of $y = 2 - x^3$ and $y = \tan x$ . The region $S$ is bounded by the $y$ -axis and the graphs of $y = 2 - x^3$ and $y = \tan x$ .	
<p>(a) Find the area of <math>S</math>.</p> <p>(b) Find the volume of the solid generated when <math>S</math> is rotated around the <math>x</math>-axis.</p> <p>(c) Find the area of <math>R</math>.</p> <p>(d) The region <math>S</math> is the base of a solid whose cross-sections are squares perpendicular to the <math>x</math>-axis. Find the volume of this solid.</p>	
<b>Homework:</b> Worksheet 64	

<b>Wednesday 12/11</b>	<b>Today's Topic: Area and Volume Review</b>
<b>In-Class Examples:</b> None	
<b>Homework:</b> Worksheet 65	

<b>Thursday 12/12</b>	<b>Today's Topic: Area and Volume Test</b>
<b>In-Class Examples:</b> None	
<b>Homework:</b> Final Exam Reviews	