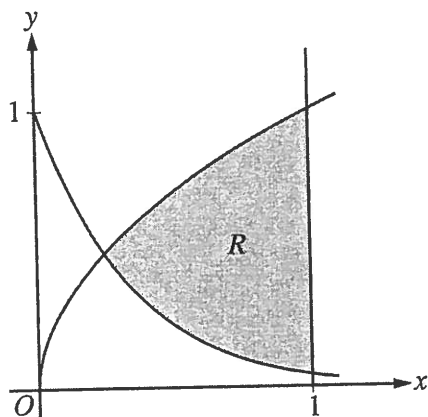


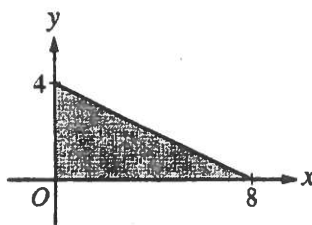
A graphing calculator is required for some problems or parts of problems.



1. Let R be the shaded region bounded by the graphs of $y = \sqrt{x}$ and $y = e^{-3x}$ and the vertical line $x = 1$, as shown in the figure above.
 - (c) The region R is the base of a solid. For this solid, each cross section perpendicular to the x -axis is a rectangle whose height is 5 times the length of its base in region R . Find the volume of this solid.

1. Let R be the region in the first and second quadrants bounded above by the graph of $y = \frac{20}{1+x^2}$ and below by the horizontal line $y = 2$.
 - (c) The region R is the base of a solid. For this solid, the cross sections perpendicular to the x -axis are semicircles. Find the volume of this solid.

86. The base of a solid is the region in the first quadrant bounded by the y -axis, the graph of $y = \tan^{-1} x$, the horizontal line $y = 3$, and the vertical line $x = 1$. For this solid, each cross section perpendicular to the x -axis is a square. What is the volume of the solid?
- (A) 2.561 (B) 6.612 (C) 8.046 (D) 8.755 (E) 20.773



86. The base of a solid is a region in the first quadrant bounded by the x -axis, the y -axis, and the line $x + 2y = 8$, as shown in the figure above. If cross sections of the solid perpendicular to the x -axis are semicircles, what is the volume of the solid?
- (A) 12.566 (B) 14.661 (C) 16.755 (D) 67.021 (E) 134.041

92. Let R be the region in the first quadrant bounded below by the graph of $y = x^2$ and above by the graph of $y = \sqrt{x}$. R is the base of a solid whose cross sections perpendicular to the x -axis are squares. What is the volume of the solid?
- (A) 0.129 (B) 0.300 (C) 0.333 (D) 0.700 (E) 1.271