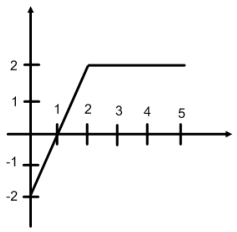
Review 7.1 to 7.3

1. The function $v(t) = 15t^4 - 12t^2$ is the velocity in m/sec of a particle moving along the x-axis, where t is measured in seconds. Use analytic methods to find the particle's displacement for $0 \le t \le 3$. (Round to the nearest 10m).

2. The graph of the velocity of a particle moving on the x-axis is given (See graph). The particle starts at x = 2 when t = 0. Find the particle's position at the end of the trip (t = 5).



3. A certain spring obeys Hooke's Law and requires a force of 12 N to stretch it 5 cm beyond its natural length. How much work would be done in stretching the spring from its natural length to 8cm beyond its natural length?

4. Find the area of the region bounded by $x = 3y^2 - 5y$ and $x = -y^3$ for $0 \le y \le 1$. Sketch a graph of the region.

5. Find the area of the region enclosed by $y = 2\sin x$ and $y = 2\cos x$ for $\frac{\pi}{4} \le x \le \frac{5\pi}{4}$.

6. The base of a solid is the region between the line $y = 18$ and the parabola $y = 2x^2$. The cross sections perpendicular to the x-axis are semicircles. Find the volume of the solid.

7. A region is bounded by the lines $y = \sqrt{x}$, $y = x - 4$ and $y = 0$. Find the volume of the solid generated by rotating this region about the x-axis.

8. The region bounded by $x = \sqrt{y-3}$ and $y = 12$ is rotated about the y-axis. Find the volume of the solid formed.

Review 7.1 to 7.3 Answers

1. 620 meters
2. 8
3. 76.8 N·cm
4. 1.25 cubic units
5. $4\sqrt{2}$ square units
6. $\frac{648\pi}{5}$ cubic units
7. 15.924π cubic units
8. $\frac{81\pi}{2}$ cubic units