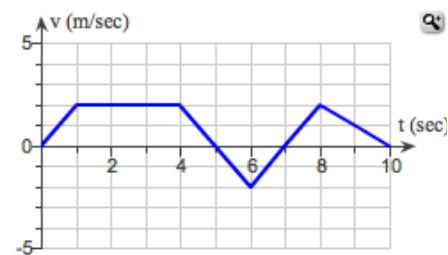


Chapter 7 Extra Practice

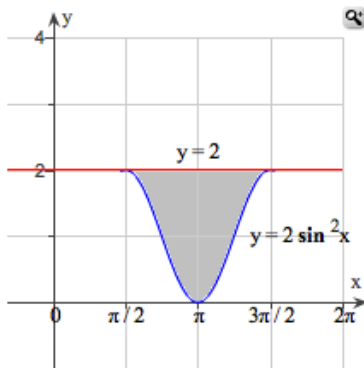
- The function $v(t) = 3 \cos t$, $0 \leq t \leq 2\pi$ is the velocity in m/sec of a particle moving along the x-axis. Use analytic methods to do each of the following.
 - Determine when the particle is moving to the right, to the left, and stopped.
 - Find the particle's displacement for the given time interval. If $s(0) = 2$ m, what is the particle's final position?
 - Find the total distance traveled by the particle.
- The function $v(t) = 6t^2 - 42t + 60$, $0 \leq t \leq 5$, is the velocity in m/sec of a particle moving along the x-axis. Use analytic methods to complete parts (a) through (c).
 - Determine when the particle is moving to the right, to the left, and stopped.
 - Find the particle's displacement for the given time interval. If $s(0) = 6$, what is the particle's final position?
 - Find the total distance traveled by the particle.
- A certain spring requires a force of 16 N to stretch it 4 cm beyond its natural length.
 - What force would be required to stretch the spring 10 cm beyond its natural length?
 - What would be the work done in stretching the spring 10 cm beyond its natural length?

4.

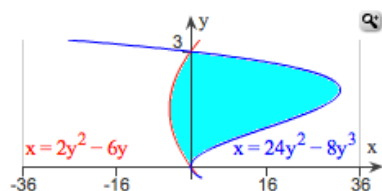
The graph of the velocity of a particle moving on the x-axis is shown on the right. The particle starts at $x = 1$ when $t = 0$. Find where the particle is at the end of the trip and find the total distance traveled by the particle.



5. Find the area of the shaded region



6. Find the area of the shaded region



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7. Find the area of the region enclosed by the curves $y = x^2 - 4x$ and $y = -x^2 + 2x$.
8. Find the volume of the solid generated by revolving the region bounded by $y = 3x^2$, $y = 0$, and $x = 2$ about the x-axis.
9. Find the volume of the solid generated by revolving the region bounded by the graphs of $y = 2x^2 + 1$ and $y = 2x + 9$ about the x-axis.
10. Find the volume of the solid generated by revolving the following region about the y-axis.

The region in the first quadrant bounded above by the parabola $y = x^2$, below by the x-axis, and on the right by the line $x = 1$

11. By integration, find the volumes of the solids generated by revolving the triangular region with vertices $(0,0)$, $(6,0)$, and $(0,5)$ about the x-axis and the y-axis.
12. Use the shell method to find the volume of the solid generated by revolving the regions bounded by the curves and lines about the y-axis
 $y = x^2$, $y = 4 - 3x$, $x = 0$, for $x \geq 0$
-
13. Use the shell method to find the volume of the solid generated by revolving the region bounded by $y = 6x - 5$, $y = \sqrt{x}$, and $x = 0$ about the y-axis.
14. Find the volume of the solid generated by revolving the region bounded by $y = 10x - x^2$ and $y = x$ about the y-axis and about the line $x = 4$.

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1.a. $[0, \pi/2) \cup (3\pi/2, 2\pi]$

b. $(\pi/2, 3\pi/2)$

c. $\pi/2, 3\pi/2$

3. a. 40 N

b. 2 J

4. π

5. 63

6. 9

7. $288\pi/5$

8. 968.89

9. $\pi/2$

10. 50π ; 60π

11. $3\pi/2$

12. $9\pi/5$

13. $2187\pi/2$; $2187\pi/2$