

Worksheet 9, Thursday, November 15, 2012

1. Consider an object travelling with velocity given by $v(t) = t^2 - 3t + 2$ feet per second.
 - (a) Graph $v(t)$.
 - (b) Graph $|v(t)|$.
 - (c) Write out the definition of $|v(t)|$.
 - (d) Compute the **Displacement** for this object from time $t = 0$ to $t = 3$.
 - (e) Compute the **Total Distance** for this object from time $t = 0$ to $t = 3$.
2. Calculate the Area bounded between $y = 4 - x^2$, $y = x + 2$, $x = -3$, and $x = 0$.
3. Compute each one of the following integrals. Simplify your answers.

(a) $\int_{\frac{\pi}{18}}^{\frac{\pi}{9}} \sec^2(3x) dx$

(b) $\int \frac{1}{x^2} \sqrt{1 - \frac{1}{x}} dx$

(c) $\int_2^4 \frac{x}{(3x^2 - 8)^2} dx$

(d) $\int \frac{\tan \sqrt{x} \sec^2 \sqrt{x}}{\sqrt{x}} dx$

(e) $\int x(1+x)^{\frac{2}{3}} dx$

4. Find a function f such that $f'(x) = \frac{\sec x \tan x}{\sqrt{\sec x + 8}}$ and $f(0) = 7$. Check your answer.

5. Compute $g''(x)$ where $g(x) = \int_x^9 \sqrt{1 + \cos t} dt$.

**** CHALLENGE**** Compute $\int \sqrt{1 + \sqrt{x}} dx$

Turn in your own solutions.