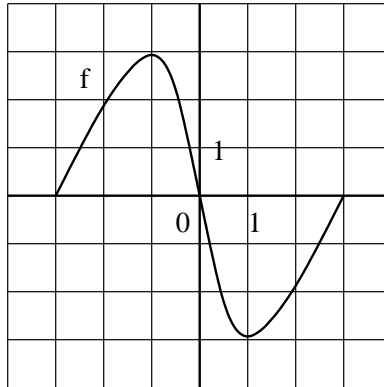


Assignment # 2

Due 6-12-06

- (1) Consider the graph of the following function:

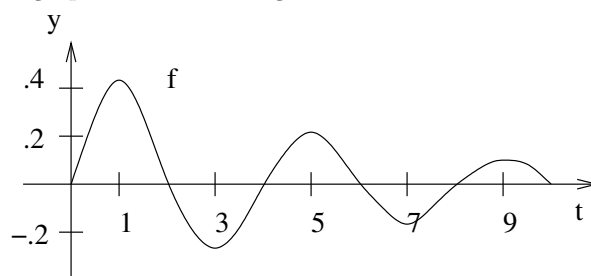


$$\text{Let } g(x) = \int_{-3}^x f(t) dt.$$

- Evaluate $g(-3)$ and $g(3)$.
 - Estimate $g(-2)$, $g(-1)$, and $g(0)$.
 - On what interval is g increasing?
 - Where does g have a maximum value?
 - Sketch a rough graph of g .
 - Use the graph in part (e) to sketch the graph of $g'(x)$. Compare with the graph of f .
- (2) Use part II of the FTC to find the derivative of the function

$$y = \int_{\cos x}^{5x} \cos(u^2) du$$

(3) Consider the graph of the following function:



Let $g(x) = \int_0^x f(t) dt$.

- (a) At what values of x do the local maximum and minimum values of g occur?
- (b) Where does g attain its absolute maximum value?
- (c) On what intervals is g concave downward?
- (d) Sketch the graph of g .

(4) Evaluate the following

(a)

$$\int \frac{e^x}{e^x + 1} dx$$

(b)

$$\int_0^{\frac{\pi}{2}} e^{\sin x} \cos x dx$$

(5) Evaluate the following

(a)

$$\int t^3 e^t dt$$

(b)

$$\int_1^4 \sqrt{t} \ln t dt$$

(6) Evaluate the following

$$\int_0^{\frac{\pi}{2}} \cos^5 x dx$$

(7) Use the substitution $x = \sec \theta$ to evaluate

$$\int \frac{\sqrt{x^2 - 1}}{x^4} dx$$

(8) Evaluate the integral

$$\int_0^{2\sqrt{3}} \frac{x^3}{\sqrt{16 - x^2}} dx$$

(9) Evaluate the integrals.

(a)

$$\int \frac{x^2 + 2x - 1}{x^3 - x} dx$$

(b)

$$\int \frac{x^2 - x + 6}{x^3 + 3x} dx$$