

Calculus I

Name: _____

Study Guide 25

Class: _____

Due Date: _____

Score: _____

No Work \Leftrightarrow No Points

Use Pencil Only \Leftrightarrow Be Neat & Organized

1. (3 points) State clearly the first fundamental theorem of calculus for integration.

2. (4 points) Find the average value of any linear function that contains the origin on the interval $[a, b]$.

2. _____

3. (4 points) Find $\frac{d}{dx} \int_0^{x^4} \sqrt{\cos \sqrt{t} + \sin \sqrt{t}} dt$

3. _____

4. (3 points) State clearly the second fundamental theorem of calculus for integration.

5. (4 points) Find $\frac{d}{dx} \int_{x-1}^{x+1} (4t^3 - 2t) dt$.

5. _____

6. (5 points) Find $f'(1)$ for $f(x) = \int_{\sqrt[3]{x}}^{\sqrt{x}} (\sqrt{t^6 + 1}) dt$.

6. _____

7. (6 points) Find f_{ave} for the function $f(x) = \pi \cos^2 x$ on the interval $[0, \pi/2]$.

7. _____

8. Find the volume of the solid obtained when revolving the enclosed region between the graphs of $f(x)$ and $g(x)$ on the given interval by the x -axis. Drawing Required.

(a) (5 points) $f(x) = x + 4$, $g(x) = 0$; $[0, 2]$

(b) (5 points) $f(x) = \sqrt{6 - x^2}$, $g(x) = 0$; $[-\sqrt{6}, \sqrt{6}]$

(a) _____

(b) _____

(c) (5 points) $f(x) = \csc x, g(x) = 0 ; [\pi/4, \pi/2]$

(d) (6 points) $f(x) = x^2 + 3, g(x) = 1 ; [-1, 1]$

(c) _____

(d) _____