

Calculus I

Name: \_\_\_\_\_

Study Guide 24

Class: \_\_\_\_\_

Due Date: \_\_\_\_\_

Score: \_\_\_\_\_

No Work  $\Leftrightarrow$  No Points

Use Pencil Only  $\Leftrightarrow$  Be Neat & Organized

1. (3 points) Find  $\frac{d}{dx} \int_0^x \sqrt{t} dt$ .

1. \_\_\_\_\_

2. (4 points) Find  $\frac{d}{dx} \int_1^x \left( \frac{1}{\sqrt{t}} + t \right) dt$ .

2. \_\_\_\_\_

3. (4 points) Find  $\frac{d}{dx} \int_0^{x^2} (\cos t + \sin t) dt$

3. \_\_\_\_\_

4. (3 points) Find  $\frac{d}{dx} \int_0^{x^3} \tan t dt$ .

4. \_\_\_\_\_

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

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5. \_\_\_\_\_

6. (5 points) Find  $\frac{d}{dx} \int_{x^3}^{x^6} \left( \sqrt{\sqrt[6]{t} + 1} \right) dt$ .

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6. \_\_\_\_\_

7. Consider the function  $f(x) = \pi \sin x$  and the interval  $[0, \pi]$ .

(a) (3 points) Find  $f_{ave}$ .

(a) \_\_\_\_\_

(b) (4 points) Find a number  $c$  in the given interval such that  $f(c) = f_{ave}$ .

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(b) \_\_\_\_\_

8. Compute the area of the region between the graphs of  $f(x)$  and  $g(x)$  on the given interval.  
Drawing Required.

(a) (5 points)  $f(x) = 2x + 4$ ,  $g(x) = 3x^2$  ;  $[0, 1]$

(b) (5 points)  $f(x) = x^2 - 4$ ,  $g(x) = 4 - x^2$  ;  $[-2, 2]$

(a) \_\_\_\_\_

(b) \_\_\_\_\_

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

(d) (5 points)  $f(x) = \cos x, g(x) = 2 ; [-\pi/2, \pi/2]$

(c) \_\_\_\_\_

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(d) \_\_\_\_\_