

Calculus I

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

Study Guide 15

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

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

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

No Work  $\Leftrightarrow$  No Points

Use Pencil Only  $\Leftrightarrow$  Be Neat & Organized

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1. Given  $f(x) = \frac{2x}{x-3}$ .

(a) (2 points) Find the domain of  $f(x)$  in interval notation.

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

(b) (2 points) Find  $f'(x)$

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

(c) (3 points) Find the points on the graph of  $f(x)$  where  $f'(x) = 0$  or undefined.

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

(d) (2 points) Find  $f''(x)$

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

(e) (3 points) Find the points on the graph of  $f(x)$  where  $f''(x) = 0$  or undefined.

(e) \_\_\_\_\_

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2. Given  $f(x) = \frac{1}{x^2 + 1}$ .

(a) (2 points) Find the domain of  $f(x)$  in interval notation.

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

(b) (2 points) Find  $f'(x)$

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

(c) (2 points) Find the points on the graph of  $f(x)$  where  $f'(x) = 0$  or undefined.

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

(d) (2 points) Find  $f''(x)$

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

(e) (2 points) Find the points on the graph of  $f(x)$  where  $f''(x) = 0$  or undefined.

(e) \_\_\_\_\_

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3. Differentiate both sides with respect to  $t$ , then solve for  $\frac{d\theta}{dt}$ .

(a) (2 points)  $\tan \theta = \frac{h}{100}$

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

(b) (2 points)  $\sin \theta = \frac{h}{100}$

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

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4. Given  $f(x) = (x - 1)^4$ .

(a) (2 points) Find  $f'(x)$

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

(b) (2 points) Solve  $f'(x) = 0$

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

(c) (2 points) Find the points on the graph of  $f(x)$  where  $f'(x) = 0$

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

(d) (2 points) Find  $f''(x)$

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

(e) (2 points) Solve  $f''(x) = 0$

(e) \_\_\_\_\_

(f) (2 points) Find the points on the graph of  $f(x)$  where  $f''(x) = 0$

(f) \_\_\_\_\_

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5. Given  $f(x) = \frac{x}{x^2 + 1}$ .

(a) (2 points) Find the domain of  $f(x)$  in interval notation.

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

(b) (2 points) Find  $f'(x)$

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

(c) (3 points) Find the points on the graph of  $f(x)$  where  $f'(x) = 0$  or undefined.

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

(d) (2 points) Find  $f''(x)$

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

(e) (3 points) Find the points on the graph of  $f(x)$  where  $f''(x) = 0$  or undefined.

(e) \_\_\_\_\_

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