

1. (1 pt) The function  $f(x) = (2x + 5)e^{3x}$  has one critical number. Find it.

Answer(s) submitted:

- 17/6

(correct)

Correct Answers:

- 2.83333333333333

2. (1 pt) Find all critical values for the function

$$f(r) = \frac{3r}{10r^2 + 6}$$

and then list them (separated by commas) in the box below.

List of critical numbers: \_\_\_\_\_

Answer(s) submitted:

- sqrt(3/5), sqrt(3/5)

(correct)

Correct Answers:

- 0.774596669241483, 0.774596669241483

3. (1 pt) The critical numbers of the function

$$f(t) = 7t^{2/3} + t^{5/3}$$

are  $t_1 = \underline{\hspace{1cm}}$  and  $t_2 = \underline{\hspace{1cm}}$  with  $t_1 < t_2$ .

Answer(s) submitted:

- 14/5
- 0

(correct)

Correct Answers:

- (2\*7/5)
- 0

4. (1 pt) Consider the function  $f(x) = 1 - 7x^2$ ,  $-3 \leq x \leq 1$ .

The absolute maximum value is \_\_\_\_\_

and this occurs at  $x$  equals \_\_\_\_\_

The absolute minimum value is \_\_\_\_\_

and this occurs at  $x$  equals \_\_\_\_\_

Answer(s) submitted:

- 1
- 0
- 62
- 3

(correct)

Correct Answers:

- 1
- 0
- 62
- 3

5. (1 pt) Consider the function  $f(x) = 2x^3 + 21x^2 - 48x + 4$ ,  $-8 \leq x \leq 2$ . This function has an absolute minimum value equal to \_\_\_\_\_

and an absolute maximum value equal to \_\_\_\_\_

Answer(s) submitted:

- 21
- 708

(correct)

Correct Answers:

- 21
- 708

6. (1 pt) Find the absolute maximum and absolute minimum values of the function

$$f(x) = (x - 3)(x - 7)^3 + 9$$

on each of the indicated intervals.

Enter 'NONE' for any absolute extrema that does not exist.

(A) Interval =  $[1, 4]$ .

Absolute maximum = \_\_\_\_\_

Absolute minimum = \_\_\_\_\_

(B) Interval =  $[1, 8]$ .

Absolute maximum = \_\_\_\_\_

Absolute minimum = \_\_\_\_\_

(C) Interval =  $[4, 9]$ .

Absolute maximum = \_\_\_\_\_

Absolute minimum = \_\_\_\_\_

Answer(s) submitted:

- 441
- 18
- 441
- 18
- 57
- 18

(correct)

Correct Answers:

- 441
- 18
- 441
- 18

- 57
- -18

7. (1 pt) Consider the function  $f(x) = -\frac{x}{3x^2 + 1}$ ,  $0 \leq x \leq 2$ .

This function has an absolute minimum value equal to: \_\_\_\_\_  
 which is attained at  $x =$  \_\_\_\_\_  
 and an absolute maximum value equal to: \_\_\_\_\_  
 which is attained at  $x =$  \_\_\_\_\_

Answer(s) submitted:

- 0.288675
- $1/\sqrt{3}$
- 0
- 0

(score 0.75)

Correct Answers:

- $-1/(2\sqrt{3})$
- $1/\sqrt{3}$
- 0
- 0

8. (1 pt) Find the absolute maximum and absolute minimum values of the function

$$f(x) = x^3 + 12x^2 - 27x + 4$$

over each of the indicated intervals.

(a) Interval =  $[-10, 0]$ .

1. Absolute maximum = \_\_\_\_\_
2. Absolute minimum = \_\_\_\_\_

(b) Interval =  $[-7, 2]$ .

1. Absolute maximum = \_\_\_\_\_
2. Absolute minimum = \_\_\_\_\_

(c) Interval =  $[-10, 2]$ .

1. Absolute maximum = \_\_\_\_\_
2. Absolute minimum = \_\_\_\_\_

Answer(s) submitted:

- 490

- 4
- 438
- -10
- 490
- -10

(correct)

Correct Answers:

- 490
- 4
- 438
- -10
- 490
- -10

9. (1 pt) Find the  $x$ -coordinate of the absolute minimum for the function

$$f(x) = 4x \ln(x) - 7x, \quad x > 0.$$

$x$ -coordinate of absolute minimum = \_\_\_\_\_

Answer(s) submitted:

- $e^{(3/4)}$

(correct)

Correct Answers:

- 2.11700001661267

10. (1 pt) Find the  $x$ -coordinate of the absolute maximum for the function

$$f(x) = \frac{2 + 6 \ln(x)}{x}, \quad x > 0.$$

$x$ -coordinate of absolute maximum = \_\_\_\_\_

Answer(s) submitted:

- $(e^{(2/3)})$

(correct)

Correct Answers:

- 1.94773404105468