

Student: Maria Saenz

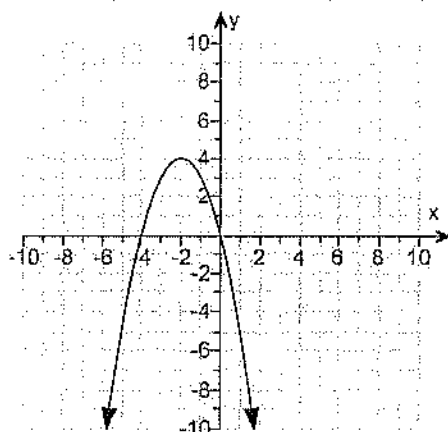
Instructor: Sumithra Iyer

Assignment: 12.1

Date: 07/16/19

Course: 1325 Summer 2- 2019

1. For the function shown in the graph, list the intervals on which the function is increasing, the intervals on which it is decreasing, and the location of all local extrema.



List the open interval(s) on which the function is increasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is increasing on the interval(s) _____.
(Type your answer in interval notation. Use a comma to separate answers as needed.)
- ☐ B. The function is never increasing.

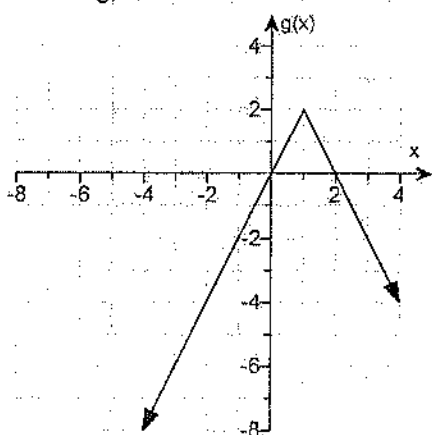
List the open interval(s) on which the function is decreasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is decreasing on the interval(s) _____.
(Type your answer in interval notation. Use a comma to separate answers as needed.)
- ☐ B. The function is never decreasing.

Identify any local extrema. Select the correct answer below and, if necessary, fill in any answer box(es) within your choice.

- ☐ A. There is no local maximum, and the local minimum/minima occur(s) at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ B. There is no local minimum, and the local maximum/maxima occur(s) at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ C. There is/are local maximum/maxima $x =$ _____, and there is/are local minimum/minima at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ D. The function has no local extrema.

2. For the function shown in the graph, list the intervals on which the function is increasing, the intervals on which it is decreasing, and the location of all local extrema.



List the open interval(s) on which the function is increasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is increasing on the interval(s) _____.
(Type your answer in interval notation. Use a comma to separate answers as needed.)
- ☐ B. The function is never increasing.

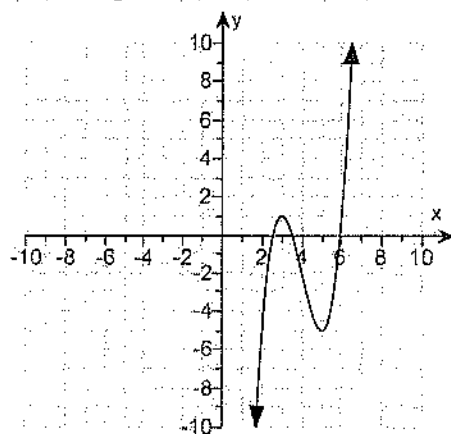
List the open interval(s) on which the function is decreasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is decreasing on the interval(s) _____.
(Type your answer in interval notation. Use a comma to separate answers as needed.)
- ☐ B. The function is never decreasing.

Identify any local extrema. Select the correct answer below and, if necessary, fill in any answer box(es) within your choice.

- ☐ A. There is no local maximum, and the local minimum/minima occur(s) at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ B. There is no local minimum, and the local maximum/maxima occur(s) at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ C. There is/are local maximum/maxima $x =$ _____, and there is/are local minimum/minima at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ D. The function has no local extrema.

3. For the function shown in the graph, list the intervals on which the function is increasing, the intervals on which it is decreasing, and the location of all local extrema.



List the open interval(s) on which the function is increasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is increasing on the interval(s) _____.
(Type your answer in interval notation. Use a comma to separate answers as needed.)
- ☐ B. The function is never increasing.

List the open interval(s) on which the function is decreasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is decreasing on the interval(s) _____.
(Type your answer in interval notation. Use a comma to separate answers as needed.)
- ☐ B. The function is never decreasing.

Identify any local extrema. Select the correct answer below and, if necessary, fill in any answer box(es) within your choice.

- ☐ A. There is no local maximum, and the local minimum/minima occur(s) at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ B. There is no local minimum, and the local maximum/maxima occur(s) at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ C. There is/are local maximum/maxima at $x =$ _____, and there is/are local minimum/minima at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ D. The function has no local extrema.

4. For the function below, find a) the critical numbers; b) the open intervals where the function is increasing; and c) the open intervals where it is decreasing.

$$f(x) = 12x^3 - 27x^2 - 36x + 1$$

a) Find the critical number(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The critical number(s) is/are _____
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- ☐ B. There are no critical numbers.

b) List any interval(s) on which the function is increasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is increasing on the interval(s) _____
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- ☐ B. The function is never increasing.

c) List any interval(s) on which the function is decreasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is decreasing on the interval(s) _____
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- ☐ B. The function is never decreasing.
-

5. For the function below, find a) the critical numbers; b) the open intervals where the function is increasing; and c) the open intervals where it is decreasing.

$$f(x) = \frac{x+8}{x+3}$$

a) Find the critical number(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The critical number(s) is/are _____.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- ☐ B. There are no critical numbers.

b) Determine the interval(s) on which the function is increasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is increasing on _____.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- ☐ B. The function is never increasing.

c) Determine the interval(s) on which the function is decreasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is decreasing on _____.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- ☐ B. The function is never decreasing.

- 6 For the function below, find a) the critical numbers; b) the open intervals where the function is increasing; and c) the open intervals where it is decreasing.

$$f(x) = \sqrt{x^2 + 5}$$

a) Find the critical number(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The critical number(s) is/are _____.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- ☐ B. There are no critical numbers.

b) Determine the interval(s) on which the function is increasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is increasing on _____.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- ☐ B. The function is never increasing.

c) Determine the interval(s) on which the function is decreasing. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The function is decreasing on _____.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- ☐ B. The function is never decreasing.

- 7 Determine the location of each local extremum of the function.

$$f(x) = x^3 + 9x^2 + 24x - 4$$

What is/are the local maximum/maxima? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The local maximum/maxima is/are _____ at $x =$ _____.
(Use a comma to separate answers as needed. Type integers or simplified fractions.)
- ☐ B. The function has no local maximum.

What is/are the local minimum/minima? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The local minimum/minima is/are _____ at $x =$ _____.
(Use a comma to separate answers as needed. Type integers or simplified fractions.)
- ☐ B. The function has no local minimum.

8. Determine the location of each local extremum of the function.

$$f(x) = -x^3 - 9x^2 - 15x + 1$$

What is/are the local minimum/minima? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The local minimum/minima is/are _____ at $x =$ _____.
(Use a comma to separate answers as needed. Type integers or simplified fractions.)
- ☐ B. The function has no local minimum.

What is/are the local maximum/maxima? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The local maximum/maxima is/are _____ at $x =$ _____.
(Use a comma to separate answers as needed. Type integers or simplified fractions.)
- ☐ B. The function has no local maximum.

Student: Maria Saenz

Instructor: Sumithra Iyer

Assignment: 12.2

Date: 07/16/19

Course: 1325 Summer 2- 2019

1. For the function $f(x) = 5x^3 - 4x^2 + 11x + 7$, find $f''(x)$. Then find $f''(0)$ and $f''(8)$.

$f''(x) =$ _____

Select the correct choice below and fill in any answer boxes in your choice.

☐ A. $f''(0) =$ _____ (Simplify your answer.)

☐ B. $f''(0)$ is undefined.

Select the correct choice below and fill in any answer boxes in your choice.

☐ A. $f''(8) =$ _____ (Simplify your answer.)

☐ B. $f''(8)$ is undefined.

2. For the function $f(x) = (3x + 4)^4$, find $f''(x)$, $f''(0)$, $f''(3)$, and $f''(-2)$.

$f''(x) =$ _____

Select the correct choice below and fill in any answer boxes within your choice.

☐ A. $f''(0) =$ _____

☐ B. $f''(0)$ is undefined.

Select the correct choice below and fill in any answer boxes within your choice.

☐ A. $f''(3) =$ _____

☐ B. $f''(3)$ is undefined.

Select the correct choice below and fill in any answer boxes within your choice.

☐ A. $f''(-2) =$ _____

☐ B. $f''(-2)$ is undefined.

3.

For the function $f(x) = -x^{\frac{2}{9}}$, find $f''(x)$, $f''(0)$, $f''(1)$, and $f''(-1)$.

$f''(x) =$ _____

Select the correct choice below and fill in any answer boxes in your choice.

- ☐ A. $f''(0) =$ _____ (Type an integer or a simplified fraction.)
☐ B. $f''(0)$ is undefined.

Select the correct choice below and fill in any answer boxes in your choice.

- ☐ A. $f''(1) =$ _____ (Type an integer or a simplified fraction.)
☐ B. $f''(1)$ is undefined.

Select the correct choice below and fill in any answer boxes in your choice.

- ☐ A. $f''(-1) =$ _____ (Type an integer or a simplified fraction.)
☐ B. $f''(-1)$ is undefined.

4.

For the function $f(x) = 3e^x$, find $f''(x)$, $f''(0)$, $f''(9)$, and $f''(-3)$.

$f''(x) =$ _____ (Type an exact answer in simplified form.)

Select the correct choice below and fill in any answer boxes within your choice.

- ☐ A. $f''(0) =$ _____ (Type an exact answer in simplified form.)
☐ B. $f''(0)$ is undefined.

Select the correct choice below and fill in any answer boxes within your choice.

- ☐ A. $f''(9) =$ _____ (Type an exact answer in simplified form.)
☐ B. $f''(9)$ is undefined.

Select the correct choice below and fill in any answer boxes within your choice.

- ☐ A. $f''(-3) =$ _____ (Type an exact answer in simplified form.)
☐ B. $f''(-3)$ is undefined.

5. The function $s(t) = 7t^2 + 9t + 1$ gives the distance from a starting point at time t of a particle moving along a line. Find the velocity and acceleration functions. Then find the velocity and acceleration at $t = 0$ and $t = 2$. Assume that time is measured in seconds and distance is measured in centimeters. Velocity will be in centimeters per second (cm/sec) and acceleration in centimeters per second per second (cm/sec²).

$v(t) =$ _____ (Do not factor.)

$a(t) =$ _____

$v(0) =$ _____ cm/sec

$v(2) =$ _____ cm/sec

$a(0) =$ _____ cm/sec²

$a(2) =$ _____ cm/sec²

6. Find the largest open intervals on which the function is concave upward or concave downward, and find the location of any points of inflection.

$f(x) = 3x^3 - 3x - 9$.

Select the correct choice below and fill in the answer box(es) to complete your choice.

(Type your answer in interval notation. Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)

- ☐ A. The function is concave downward on _____ . The function never has an interval that is concave upward/downward.
- ☐ B. The function is concave upward on _____ . The function never has an interval that is concave upward/downward.
- ☐ C. The function is concave upward on _____ and concave downward on _____ .

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The point(s) of inflection is/are at _____ .
(Type an ordered pair. Use a comma to separate answers as needed.)
- ☐ B. There is no point of inflection.

7. Find the largest open intervals on which the function is concave upward or concave downward, and find the location of any points of inflection.

$$f(x) = x^3 + 4x^2 - 4x + 6$$

Select the correct choice below and fill in the answer boxes to complete your choice.

(Type your answer in interval notation. Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)

- ☐ A. The function is concave upward on _____ and concave downward on _____.
- ☐ B. The function is concave downward on _____. There are no intervals on which the function is concave upward.
- ☐ C. The function is concave upward on _____. There are no intervals on which the function is concave downward.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

The function has point(s) of inflection at _____.

- ☐ A. (Type an ordered pair. Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)
- ☐ B. There is no point of inflection.

8. Find all critical numbers for the following function. Then use the second-derivative test on each critical number to determine whether it leads to a local maximum or minimum.

$$f(x) = -2x^3 - 3x^2 + 120x + 5$$

Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

- ☐ A. The critical number(s) is/are $x =$ _____. There is a local maximum at $x =$ _____. There is a local minimum at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ B. The critical number(s) is/are $x =$ _____. There is a local maximum at $x =$ _____. There is no local minimum.
(Use a comma to separate answers as needed.)
- ☐ C. The critical number(s) is/are $x =$ _____. There is no local maximum. There is a local minimum at $x =$ _____.
(Use a comma to separate answers as needed.)
- ☐ D. The critical number(s) is/are $x =$ _____. There is no local maximum and no local minimum.
(Use a comma to separate answers as needed.)
- ☐ E. There are no critical numbers.

9

Find all critical numbers of the function $f(x) = (x - 4)^7$. Then use the second-derivative test on each critical number to determine whether it leads to a local maximum or minimum.

Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

- ☐ A. The critical number(s) is/are at $x =$ _____. There is a local maximum at $x =$ _____. There is no local minimum.
(Type integers or simplified fractions. Use a comma to separate answers as needed.)
- ☐ B. The critical number(s) is/are at $x =$ _____. There is no local maximum. There is a local minimum at $x =$ _____.
(Type integers or simplified fractions. Use a comma to separate answers as needed.)
- ☐ C. The critical number(s) is/are at $x =$ _____. There is no local maximum and no local minimum.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- ☐ D. The critical number(s) is/are at $x =$ _____. There is a local maximum at $x =$ _____. There is a local minimum at $x =$ _____.
(Type integers or simplified fractions. Use a comma to separate answers as needed.)
- ☐ E. There are no critical numbers.

10

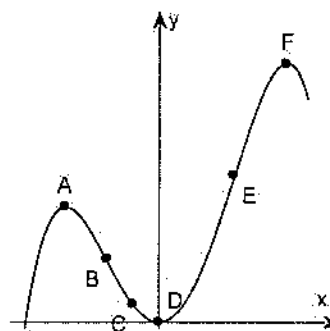
Find all critical numbers of the function $y = \frac{x^2 - 9}{x - 5}$, $x \neq 5$. Then use the second-derivative test on each critical number to determine whether it leads to a local maximum or minimum.

Select the correct choice below and fill in any answer boxes within your choice.

- ☐ A. The local maxima occur at $x =$ _____ and the local minima occur at $x =$ _____.
(Type an integer or simplified fraction. Use a comma to separate answers as needed.)
- ☐ B. The local minima occur at $x =$ _____ and there are no local maxima.
(Type an integer or simplified fraction. Use a comma to separate answers as needed.)
- ☐ C. The local maxima occur at $x =$ _____ and there are no local minima.
(Type an integer or simplified fraction. Use a comma to separate answers as needed.)
- ☐ D. There are no local extrema.

11. In each part, list the points (A–F) on the graph of f whose x -coordinates satisfy the given conditions.

- (a) $f'(x) > 0$ and $f''(x) > 0$
- (b) $f'(x) < 0$ and $f''(x) > 0$
- (c) $f'(x) = 0$ and $f''(x) < 0$
- (d) $f'(x) = 0$ and $f''(x) > 0$
- (e) $f'(x) < 0$ and $f''(x) = 0$



A B C D E F

Drag each of the points given above into the appropriate category below, depending on whether or not they satisfy the conditions in parts (a) through (e).

(a)	(b)	(c)	(d)	(e)

12. The price of a company's stock over the 12-week period at the beginning of 2012 can be approximated by the function $f(x) = 37.2x^{0.1}$, where $x = 1$ designates the beginning of week 1.

- (a) When is the stock increasing in price?
- (b) At what rate is the stock increasing at the beginning of the 5th week?
- (c) At what rate is the stock increasing at the beginning of the 9th week?

(a) When is the stock increasing in price? Select the correct answer below, and if necessary, fill in any answer boxes to complete your choice.

- ☐ A. The stock is increasing in price from week _____ to week _____.
- ☐ B. The stock doesn't increase over the 12-week period.

(b) At what rate is the stock increasing at the beginning of the 5th week?

$$f'(5) = \$ \underline{\hspace{2cm}} / \text{week}$$

(Round to the nearest cent as needed.)

(c) At what rate is the stock increasing at the beginning of the 9th week?

$$f'(9) = \$ \underline{\hspace{2cm}} / \text{week}$$

(Round to the nearest cent as needed.)

- 13 The price of a company's stock over the 12-week period at the beginning of 2012 can be approximated by the function $f(x) = 32.6x^{0.1}$, where $x = 1$ designates the beginning of week 1.

- (a) When is the stock increasing in price?
(b) At what rate is the stock increasing at the beginning of the 4th week?
(c) At what rate is the stock increasing at the beginning of the 7th week?

(a) When is the stock increasing in price? Select the correct answer below, and if necessary, fill in any answer boxes to complete your choice.

- ☐ A. The stock is increasing in price from week _____ to week _____.
☐ B. The stock doesn't increase over the 12-week period.

(b) At what rate is the stock increasing at the beginning of the 4th week?

$f'(4) = \$$ _____ /week
(Round to the nearest cent as needed.)

(c) At what rate is the stock increasing at the beginning of the 7th week?

$f'(7) = \$$ _____ /week
(Round to the nearest cent as needed.)

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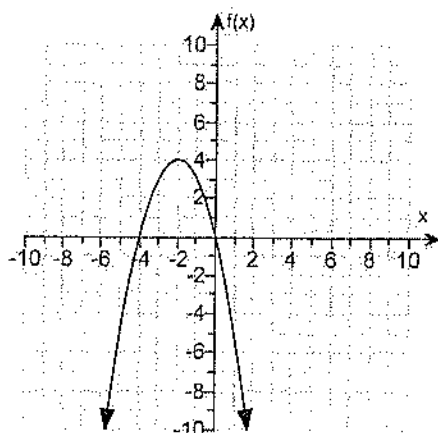
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Assignment: 12.3

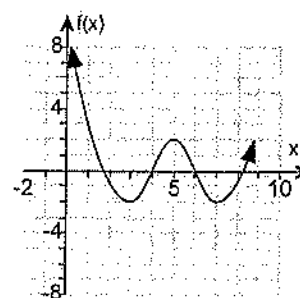
1. Find the location of the absolute maximum and absolute minimum of the function on the interval $[-5, -1]$.



The absolute minimum occurs at $x =$ _____.
(Use a comma to separate answers as needed.)

The absolute maximum occurs at $x =$ _____.
(Use a comma to separate answers as needed.)

2. Find the location of the absolute maximum and absolute minimum of the function on the interval $[2, 7]$.



The absolute maximum occurs at $x =$ _____.
(Use a comma to separate answers as needed.)

The absolute minimum occurs at $x =$ _____.
(Use a comma to separate answers as needed.)

3. Find the absolute extrema of the function $f(x) = -x^4 + 50x^2 - 625$ on the interval $[-6, 6]$.

The function has an absolute maximum at $x =$ _____.
(Simplify your answer. Use a comma to separate answers as needed.)

The function has an absolute minimum at $x =$ _____.
(Simplify your answer. Use a comma to separate answers as needed.)

4. Find the absolute extrema of the function $f(x) = \frac{9+x}{9-x}$ on the interval $[3, 6]$.

The absolute maximum occurs at $x =$ _____.
(Simplify your answer. Use a comma to separate answers as needed.)

The absolute minimum occurs at $x =$ _____.
(Simplify your answer. Use a comma to separate answers as needed.)

5. Find the absolute extrema of the function $f(x) = (x^2 + 7)^{1/3}$ on the interval $[-1, 5]$.

The absolute maximum occurs at $x =$ _____.

(Simplify your answer. Use a comma to separate answers as needed.)

The absolute minimum occurs at $x =$ _____.

(Simplify your answer. Use a comma to separate answers as needed.)

6. If possible, find an absolute extremum of $g(x) = -\frac{(x+7)}{e^x}$ on the interval $(-10, 0)$.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.
(Simplify your answer. Use a comma to separate answers as needed.)

- ☐ A. The function $g(x)$ has an absolute maximum at $x =$ _____ and no absolute minimum.
- ☐ B. The function $g(x)$ has an absolute maximum at $x =$ _____ and an absolute minimum at $x =$ _____.
- ☐ C. The function $g(x)$ has no absolute maximum and an absolute minimum at $x =$ _____.
- ☐ D. The function $g(x)$ does not have an absolute maximum or an absolute minimum.

7. A disease has hit a city. The percentage of the population infected t days after the disease arrives is approximated by $p(t) = 8t e^{-t/11}$ for $0 \leq t \leq 44$. After how many days is the percentage of infected people a maximum? What is the maximum percent of the population infected?

The percentage of infected people reaches a maximum after _____ days.
(Simplify your answer.)

The maximum percent of the population infected is _____%.
(Round to the nearest hundredth as needed.)

8. A candy box is made from a piece of cardboard that measures 19 by 11 inches. Squares of equal size will be cut out of each corner. The sides will then be folded up to form a rectangular box. What size square should be cut from each corner to obtain maximum volume?

A square with a side of length _____ inches should be cut away from each corner to obtain the maximum volume.
(Round to the nearest hundredth as needed.)

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7. Find the equation of the tangent line at the given point on the following curve.

$$x^2 + y^2 = 25, (3, -4)$$

The equation of the tangent line to the point $(3, -4)$ is $y =$ _____.

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8. Find the equation of the tangent line to the curve at the given point.

$$y^5 = 1024x^3 \text{ at } (1,4)$$

The equation of the tangent line is _____.

(Type an equation. Type an exact answer.)

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Assignment: 12.5

1. Assume x and y are functions of t . Evaluate $\frac{dy}{dt}$ for the following.

$$y^3 = 2x^4 + 6; \quad \frac{dx}{dt} = 3, \quad x = 1, \quad y = 2$$

$$\frac{dy}{dt} = \underline{\hspace{2cm}} \quad (\text{Round to two decimal places as needed.})$$

2. Given that x and y are functions of time, find the indicated rate of change.

$$\text{Find } \frac{dx}{dt} \text{ when } x = 3, y = 3, \text{ and } \frac{dy}{dt} = -1, \text{ given that } xy = x + y.$$

$$\frac{dx}{dt} = \underline{\hspace{2cm}} \quad (\text{Round to one decimal place as needed.})$$

3. Given that x and y are functions of time, find the indicated rate of change.

$$\text{Find } \frac{dy}{dt} \text{ when } x = 3 \text{ and } \frac{dx}{dt} = -4, \text{ given that } x^4 + y^4 = 337.$$

$$\frac{dy}{dt} = \underline{\hspace{2cm}} \quad (\text{Round to two decimal places as needed.})$$

4. Given that x and y are functions of time, find the indicated rate of change.

$$\text{Find } \frac{dx}{dt} \text{ when } y = 1 \text{ and } \frac{dy}{dt} = 1, \text{ given that } x^4 = 9y^4 - 8.$$

$$\frac{dx}{dt} = \underline{\hspace{2cm}} \quad (\text{Round to two decimal places as needed.})$$

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Assignment: 12.6

Date: 07/16/19

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- 1 Find and graph the coordinates of any local extrema and points of inflection of the function $y = x^2 - 4x + 3$.

Choose the correct answer regarding local extrema.

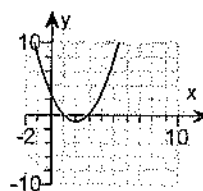
- ☐ A. The function has a local maximum at $(2, -1)$.
- ☐ B. The function has a local minimum at $(2, -1)$.
- ☐ C. The function has no local extrema.

Choose the correct answer regarding points of inflection.

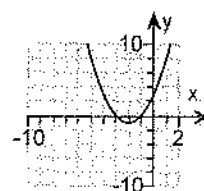
- ☐ A. The function has no inflection points.
- ☐ B. The function has an inflection point at $(0, 3)$.
- ☐ C. The function has an inflection point at $(2, -1)$.
- ☐ D. The function has inflection points at $(3, 0)$ and $(1, 0)$.

Choose the correct graph of the function.

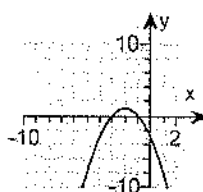
☐ A.



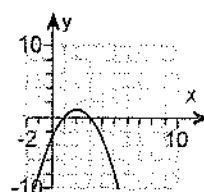
☐ B.



☐ C.



☐ D.



2. Sketch the graph of the given function. Identify any local extrema and points of inflection.

$$f(x) = x^3 - 7x^2 - 5x + 1$$

What are the coordinates of the relative maxima? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A.

(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

☐ B. There is no maximum.

What are the coordinates of the relative minima? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A.

(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

☐ B. There is no minimum.

What are the coordinates of the points of inflection? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

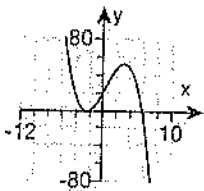
☐ A.

(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

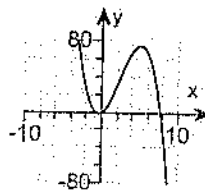
☐ B. There are no inflection points.

Choose the correct graph below.

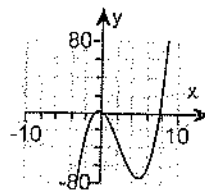
☐ A.



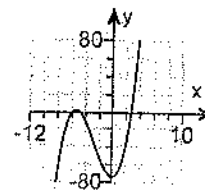
☐ B.



☐ C.



☐ D.



3. Sketch the graph of the function. Identify any local extrema and points of inflection.

$$f(x) = \frac{x^2 + 25}{5x}$$

What are the coordinates of the relative maxima? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A.

(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

☐ B. There is no maximum.

What are the coordinates of the relative minima? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A.

(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

☐ B. There is no minimum.

What are the coordinates of the points of inflection? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

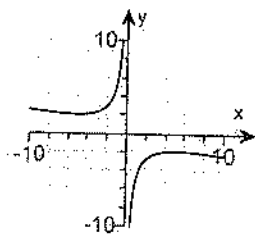
☐ A.

(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

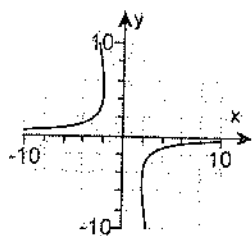
☐ B. There are no inflection points.

Choose the correct graph below.

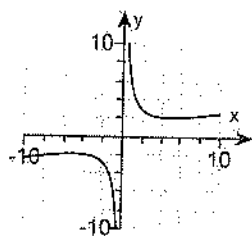
☐ A.



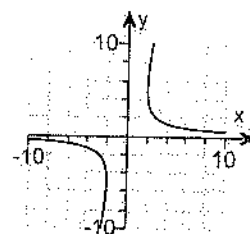
☐ B.



☐ C.



☐ D.



Student: Maria Saenz

Instructor: Sumithra Iyer

Assignment: 13.1

Date: 08/07/19

Course: 1325 Summer 2- 2019

8. Find the cost function if the marginal cost function is given by $C'(x) = x^{1/3} + 4$ and 8 units cost \$85.

$C(x) =$ _____

Student: Maria Saenz

Instructor: Sumithra Iyer

Assignment: 13.2

Date: 08/07/19

Course: 1325 Summer 2- 2019

3. Evaluate the integral.

$$\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$$

$$\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx = \underline{\hspace{2cm}}$$

(Use C as the arbitrary constant.)

Student: Maria Saenz

Instructor: Sumithra Iyer

Date: 08/07/19

Course: 1325 Summer 2- 2019

Assignment: 13.3

1. Approximate the area under the following curve and above the x-axis on the given interval, using rectangles whose height is the value of the function at the left side of the rectangle.

- (a) Use two rectangles.
- (b) Use four rectangles.
- (c) Use a graphing calculator (or other technology) and 40 rectangles.

$$f(x) = 2 - x^2; [-1, 1]$$

(a) The approximated area when using two rectangles is _____ square units.

(Type an integer or decimal rounded to two decimal places as needed.)

(b) The approximated area when using four rectangles is _____ square units.

(Type an integer or decimal rounded to two decimal places as needed.)

(c) The approximated area when using 40 rectangles is _____ square units.

(Type an integer or decimal rounded to two decimal places as needed.)

Student: Maria Saenz

Instructor: Sumithra Iyer

Date: 08/07/19

Course: 1325 Summer 2- 2019

Assignment: 13.5

1. Find the area between the curves.

$$x = -5, x = 1, y = 2x, y = x^2 - 3$$

The area between the curves is _____.

(Type an integer or an improper fraction. Simplify your answer.)

2

- Find the area between $y = 3x$ and $y = x^2$ from $x = 0$ to $x = \frac{1}{3}$.

The area is _____.

(Simplify your answer.)

Student: Maria Saenz

Instructor: Sumithra Iyer

Date: 08/07/19

Course: 1325 Summer 2- 2019

Assignment: 13.7

- 1 Find the general solution for the differential equation.

$$\frac{dy}{dx} = 12e^{-4x}$$

y = _____

- 2 Find the general solution for the differential equation.

$$\frac{dy}{dx} = 13xy$$

The general solution of $\frac{dy}{dx} = 13xy$ is y = _____.

(Use k as the arbitrary constant.)

- 3 Solve.

$$\frac{dy}{dx} = 7y$$

y = _____

(Type an exact answer. Use C as the arbitrary constant.)

- 4 Solve the initial value problem explicitly.

$$\frac{du}{dx} = 6x^5 - 4x^3 + 5 \text{ and } u = -3 \text{ when } x = 1$$

u = _____