Student: Cole Lamers **Date:** 09/21/19	**Instructor:** Viktoriya Shcherban **Course:** Calc 1 11:30 AM / Internet (81749&81750) Shcherban	**Assignment:** 4.1 Extreme Values of Functions (set 2)

1. Find the absolute maximum and minimum values of the function on the given interval. Then graph the function. Identify the points on the graph where the absolute extrema occur.

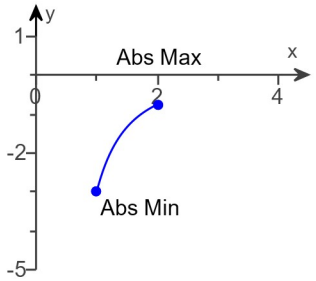
$f(x) = -\frac{3}{x^2}, \quad 1 \le x \le 2$

The absolute maximum is $-\frac{3}{4}$ at x = 2.

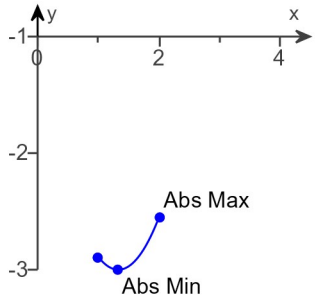
The absolute minimum is -3 at x = 1.

Choose the correct graph of the function.

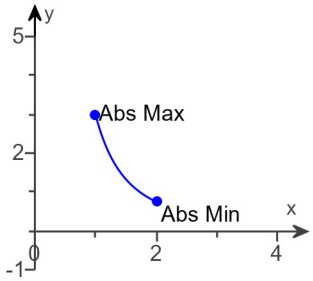
A.



B.



C.



2. Find the absolute maximum and minimum values of the function on the given interval.

$f(x) = \sqrt{-x^2 + 1}, \quad 0 \le x \le 1$

The absolute maximum of the function $f(x) = \sqrt{-x^2 + 1}$ on the interval $0 \le x \le 1$ has a value of 1.
(Simplify your answer.)

The absolute minimum of the function $f(x) = \sqrt{-x^2 + 1}$ on the interval $0 \le x \le 1$ has a value of 0.
(Simplify your answer.)

3. Find the absolute maximum and minimum values of the function on the given interval. Then graph the function. Identify the points on the graph where the absolute extrema occur.

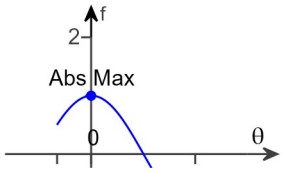
$f(\theta) = \cos\theta, \quad -\frac{\pi}{3} \le \theta \le \pi$

The absolute maximum is 1 at $\theta =$ 0.
(Type exact answers, using π as needed.)

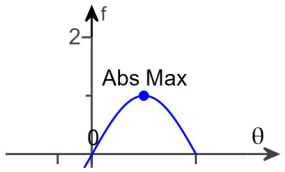
The absolute minimum is -1 at $\theta =$ π.
(Type exact answers, using π as needed.)

Choose the correct graph of the function.

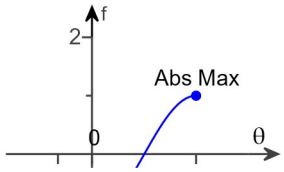
A.



B.



C.



4. Find the absolute maximum and minimum values of the function on the given interval.

$f(x) = -8\csc x, \quad -\frac{3\pi}{4} \le x \le -\frac{\pi}{4}$

The absolute maximum of the function $f(x) = -8\csc x$ on the interval $-\frac{3\pi}{4} \le x \le -\frac{\pi}{4}$ has a value of $8\sqrt{2}$.
(Type an exact answer, using radicals as needed.)

The absolute minimum of the function $f(x) = -8\csc x$ on the interval $-\frac{3\pi}{4} \le x \le -\frac{\pi}{4}$ has a value of 8.
(Type an exact answer, using radicals as needed.)

5. Determine all critical points for the following function.

$f(x) = x^2 - 10x + 4$

$x =$ 5 (Use a comma to separate answers as needed.)

6. Determine all critical points for the function.

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

$x =$ 0, −2
(Use a comma to separate answers as needed.)

7. Determine all critical points for the following function.

$f(x) = 3x(4 - x)^3$

$x =$ 1,4 (Use a comma to separate answers as needed.)

8. Determine all critical points for the following function.

$$f(x) = x^2 + \frac{250}{x}$$

x = 5 (Use a comma to separate answers as needed.)

9. Find the extreme values of the following function and where they occur.

$$y = x^3 - x^2 - 8x + 12$$

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

(Simplify your answers.)

- **A.** The given function has a local maximum value $\frac{500}{27}$ at x = $-\frac{4}{3}$ and a local minimum value 0 at x = 2.
- **B.** The given function has a local maximum value _____ at x = _____.
- **C.** The given function has a local minimum value _____ at x = _____.
- **D.** There are no extreme values.

10. Find the extreme values of the following function and where they occur.

$$f(x) = \sqrt{x^2 - 64}$$

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

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

- **A.** The given function has an absolute minimum value 0 at x = −8,8.
- **B.** The given function has an absolute minimum value _____ at x = _____ and an absolute maximum value _____ at x = _____.
- **C.** The given function has an absolute maximum value _____ at x = _____.
- **D.** There are no extreme values.

11. Find the extreme values of the following function and where they occur.

$$y = \frac{x+1}{x^2+2x+2}$$

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

- **A.** The function has an absolute minimum of _____ at x = _____.
  (Use a comma to separate answers as needed.)
- **B.** The function has an absolute minimum of $-\frac{1}{2}$ at x = -2 and an absolute maximum of $\frac{1}{2}$ at x = 0.
  (Use a comma to separate answers as needed.)
- **C.** The function has an absolute maximum of _____ at x = _____.
  (Use a comma to separate answers as needed.)

12. Find the critical points, domain endpoints, and local extreme values for the function.

$y = x^{2/5}(x - 3)$

What is/are the critical point(s) or domain endpoint(s) where f′ is undefined? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The critical point(s) or domain endpoint(s) where f′ is undefined is/are at x = 0 .
  (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- **B.** There are no critical points or domain endpoints where f′ is undefined.

What is/are the critical point(s) where f′ is 0? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The critical point(s) where f′ is 0 is/are at x = $\frac{6}{7}$.
  (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- **B.** There are no critical points where f′ is 0.

From the critical point(s) and domain endpoint(s), what is/are the point(s) corresponding to local maxima? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The point(s) corresponding to the local maxima is/are (0,0) .
  (Type an ordered pair. Use integers or decimals for any numbers in the expression. Round to the nearest thousandth as needed. Use a comma to separate answers as needed.)
- **B.** There are no points corresponding to local maxima.

From the critical point(s) and domain endpoint(s), what is/are the point(s) corresponding to local minima? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The point(s) corresponding to the local minima is/are (.857, − 2.015) .
  (Type an ordered pair. Use integers or decimals for any numbers in the expression. Round to the nearest thousandth as needed. Use a comma to separate answers as needed.)

13. Find the critical points, domain endpoints, and local extreme values (absolute and local) for the function.

$$y = \begin{cases} 3 - 4x, & x \le 1 \\ 2x - 3, & x > 1 \end{cases}$$

What is/are the x-value(s) of the critical point(s)? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The critical point(s) is/are at x = 1 .
  (Round to the nearest thousandth as needed. Use a comma to separate answers as needed.)
- **B.** There are no critical points.

What is/are the x-value(s) of the domain endpoint(s)? Select the correct choice below and, if necessary, fill in the answer box within your choice.

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  (Round to the nearest thousandth as needed. Use a comma to separate answers as needed.)

What are the points, if any, corresponding to local maxima? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The point(s) corresponding to the local maxima is/are .
  (Type an ordered pair. Use integers or decimals for any numbers in the expression. Round to the nearest thousandth as needed. Use a comma to separate answers as needed.)
- **B.** There are no points corresponding to local maxima.

What are the points, if any, corresponding to local minima? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The point(s) corresponding to the local minima is/are (1, − 1) .
  (Type an ordered pair. Use integers or decimals for any numbers in the expression. Round to the nearest thousandth as needed. Use a comma to separate answers as needed.)
- **B.** There are no points corresponding to local minima.

What are the points, if any, corresponding to absolute maxima? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The point(s) corresponding to the absolute maxima is/are .
  (Type an ordered pair. Use integers or decimals for any numbers in the expression. Round to the nearest thousandth as needed. Use a comma to separate answers as needed.)
- **B.** There are no points corresponding to absolute maxima.

What are the points, if any, corresponding to absolute minima? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The point(s) corresponding to the absolute minima is/are (1, − 1) .
  (Type an ordered pair. Use integers or decimals for any numbers in the expression. Round to the nearest thousandth as needed. Use a comma to separate answers as needed.)
- **B.** There are no points corresponding to absolute minima.