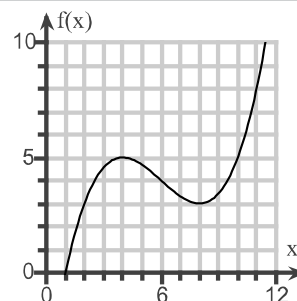


Student: _____
Date: _____
Time: _____

Instructor: Dan Yasaki
Course: MAT 120 (Summer 2013)
Book: Barnett: Calculus for Business,
Economics, Life/Social Sciences, 12e

Assignment: 5.5-5.6 Homework

1. For the graph of $y = f(x)$ shown on the right, find the absolute minimum and the absolute maximum over the interval $[6, 10]$.



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

- A. The absolute minimum is at $f(\square) = \square$.
 B. There is no absolute minimum.

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

- A. The absolute maximum is at $f(\square) = \square$.
 B. There is no absolute maximum.

2. Find the absolute maximum and minimum values of the function over the indicated interval, and indicate the x -values at which they occur.

$$f(x) = 5x - 3; [-6, 2]$$

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

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

3. Find the absolute maximum and minimum values of the function over the indicated interval, and indicate the x -values at which they occur.

$$f(x) = x^2 - 2x - 5; [-1, 5]$$

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

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

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4. Find the absolute maximum and minimum, if either exists, for $f(x) = 4x^3 - 3x^4$.

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

- A. The absolute minimum is $f(\square) = \square$.
- B. There is no absolute minimum.

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

- A. The absolute maximum is $f(\square) = \square$.
- B. There is no absolute maximum.

5. Find the absolute maximum and minimum, if either exists, for $f(x) = x + \frac{25}{x}$.

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

- A. The absolute maximum is $f(\square) = \square$.
- B. There is no absolute maximum.

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

- A. The absolute minimum is $f(\square) = \square$.
- B. There is no absolute minimum.

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6. Find the absolute maximum and minimum, if either exists, for $f(x) = \frac{8x}{x^2 + 4}$.

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

- A. There is an absolute minimum at $f(\square) = \square$. (Type an integer or a fraction.)
 B. There is no absolute minimum.

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

- A. There is an absolute maximum at $f(\square) = \square$. (Type an integer or a fraction.)
 B. There is no absolute maximum.

7. Find the absolute minimum value on $[0, \infty)$ for $f(x) = 3x^2 - 12x + 2$.

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

- A. The absolute minimum occurs at $f(\square) = \square$.
 B. There is no absolute minimum.

8. Find the absolute maximum value on $(0, \infty)$ for $f(x) = 2x^4 - 8x^3$.

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

- A. The absolute maximum occurs at $f(\square) = \square$.
 B. There is no absolute maximum.

9. Find the absolute maximum value on $(0, \infty)$ for $f(x) = 18 - 12x - \frac{12}{x}$.

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

- A. The absolute maximum occurs at $f(\square) = \square$.
 B. There is no absolute maximum.

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10. Find the absolute maximum value on $(0, \infty)$ for $f(x) = 7x - 4x \ln x$.

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

- A. The absolute maximum is $f(\square) \approx \square$.
(Round to two decimal places as needed.)
- B. There is no absolute maximum.

11. Find the absolute maximum and minimum, if either exists, for $f(x) = (x - 4)(x - 8)^3 + 5$ on $[2, 9]$.

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

- A. The absolute maximum is $f(\square) = \square$.
- B. There is no absolute maximum.

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

- A. The absolute minimum is $f(\square) = \square$.
- B. There is no absolute minimum.

12. Find the absolute maximum and minimum values of the function over the indicated interval, and indicate the x-values at which they occur.

$$f(x) = x^4 - 2x^2 + 2; [-2, 2]$$

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

- A. The absolute maximum value is \square at $x = \square$.
(Use a comma to separate answers as needed.)
- B. There is no absolute maximum.

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

- A. The absolute minimum value is \square at $x = \square$.
(Use a comma to separate answers as needed.)
- B. There is no absolute minimum.

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13. Find two numbers whose sum is 16 and whose product is a maximum.

The two numbers are .

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

14. Find the dimensions of a rectangle with an area of 256 square feet that has the minimum perimeter.

The dimensions of this rectangle are ft.

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

15. A company manufactures and sells x cellphones per week. The weekly price-demand and cost equations are given below.

$$p = 500 - 0.1x \text{ and } C(x) = 15,000 + 140x$$

(A) What price should the company charge for the phones, and how many phones should be produced to maximize the weekly revenue? What is the maximum weekly revenue?

The company should produce phones each week at a price of \$.

(Round to the nearest cent as needed.)

The maximum weekly revenue is \$. (Round to the nearest cent as needed.)

(B) What price should the company charge for the phones, and how many phones should be produced to maximize the weekly profit? What is the maximum weekly profit?

The company should produce phones each week at a price of \$.

(Round to the nearest cent as needed.)

The maximum weekly profit is \$. (Round to the nearest cent as needed.)

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16. A deli sells 320 sandwiches per day at a price of \$4 each.
- (A) A market survey shows that for every \$0.10 reduction in the price, 20 more sandwiches will be sold. How much should the deli charge in order to maximize revenue?

The deli should charge \$ for a sandwich to maximize revenue.

(Round to the nearest cent as needed.)

- (B) A different market survey shows that for every \$0.20 reduction in the original \$4 price, 10 more sandwiches will be sold. Now how much should the deli charge in order to maximize revenue?

Now the deli should charge \$ for a sandwich to maximize revenue.

(Round to the nearest cent as needed.)

17. A candy box is made from a piece of cardboard that measures 27 by 15 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.)

18. A fence is to be built to enclose a rectangular area of 800 square feet. The fence along three sides is to be made of material that costs \$5 per foot. The material for the fourth side costs \$15 per foot. Find the dimensions of the rectangle that will allow for the most economical fence to be built.

The short side is ft and the long side is ft.

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1. A, 8, 3
A, 10, 5

2. 7
2
- 33
- 6

3. 10
5
- 6
1

4. B
A, 1, 1

5. B
B

6. A, - 2, - 2
A, 2, 2

7. A, 2, - 10

8. B

9. A, 1, - 6

10. A, 2.12, 8.47

11. A, 2, 437
A, 5, - 22

12. A, 10, - 2,2
A, 1, - 1,1

13. 8,8

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14. 16,16

15. 2,500
250
625,000.00
1,800
320
309,000.00

16. 2.80
4.00

17. 3.09

18. 20
40