

Review for Test 4

Provide an appropriate response.

1) Use the first derivative test to determine the local extrema, if any, for the function:

1) _____

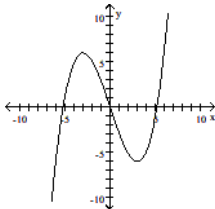
$$f(x) = 3x^4 - 6x^2 + 7.$$

- A) local max at $x = 0$ and local min at $x = -1$ and $x = 1$
- B) local max at $x = 1$ and local min at $x = 0$
- C) local min at $x = 0$ and local max at $x = -1$ and $x = 1$
- D) local max at $x = -1$ and local min at $x = 0$ and $x = 1$

Use the graph of the function $f(x)$ to locate the local extrema and identify the intervals where the function is concave up and concave down.

2)

2) _____



- A) Local minimum at $x = 3$; local maximum at $x = -3$; concave up on $(0, -3)$ and $(3, \infty)$; concave down on $(-3, 3)$
- B) Local maximum at $x = 3$; local minimum at $x = -3$; concave up on $(0, -3)$ and $(3, \infty)$; concave down on $(-3, 3)$
- C) Local minimum at $x = 3$; local maximum at $x = -3$; concave up on $(0, \infty)$; concave down on $(-\infty, 0)$
- D) Local minimum at $x = 3$; local maximum at $x = -3$; concave down on $(0, \infty)$; concave up on $(-\infty, 0)$

Provide an appropriate response.

3) Find the critical values and determine the intervals where $f(x)$ is decreasing and the intervals where $f(x)$ is increasing for $f(x) = 3x^4 - 6x^2 + 7$.

3) _____

$$f(x) = 3x^4 - 6x^2 + 7.$$

- A) decreasing on $(-1, 0)$ and $(1, \infty)$; increasing on $(-\infty, -1)$
- B) increasing on $(-1, 0)$ and $(1, \infty)$; decreasing on $(-\infty, -1)$ and $(0, 1)$
- C) decreasing on $(-1, 0)$ and $(1, \infty)$; increasing on $(-\infty, -1)$ and $(0, 1)$
- D) increasing on $(-1, 0)$; decreasing on $(-\infty, -1)$ and $(0, 1)$

4) Find $f''(x)$ for $f(x) = 5x^4 - 6x^2 + 7$.

4) _____

- A) $f''(x) = 20x^2 - 12x$
- B) $f''(x) = 60x^2 - 12$
- C) $f''(x) = 60x^2 - 12x$
- D) $f''(x) = 20x^2 - 12$

- 5) Determine the interval(s) over which $f(x) = (x + 3)^3$ is concave upward. 5) _____
 A) $(-\infty, 3)$ B) $(-3, \infty)$ C) $(-\infty, -3)$ D) $(-\infty, \infty)$
- 6) Find the inflection point(s) for $f(x) = x^3 - 6x - 1$. 6) _____
 A) $(1, -1)$ B) $(0, -1)$ C) $(0, -6)$ D) $(-1, 6)$

Decide if the given value of x is a critical number for f , and if so, decide whether the point for x on f is a local minimum, local maximum, or neither.

- 7) $f(x) = (x + 4)^4$; $x = -4$ 7) _____
 A) Critical number; minimum at $(-4, 0)$ B) Critical number; maximum at $(-4, 0)$
 C) Not a critical number. D) Critical number but not an extreme point.

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

- 8) $y = x^3 - 12x + 2$ 8) _____
 A) Local maximum at $(0, 0)$.
 B) None
 C) Local maximum at $(-2, 18)$, local minimum at $(2, -14)$.
 D) Local maximum at $(2, -14)$, local minimum at $(-2, 18)$.

Find the integral.

- 9) $\int (4x^{11} - 7x^3 + 8) dx$ 9) _____
 A) $12x^{12} - \frac{7}{4}x^4 + 8x + C$ B) $12x^{12} - \frac{7}{3}x^4 + 8x + C$
 C) $\frac{1}{3}x^{12} - \frac{7}{4}x^4 + 8x + C$ D) $\frac{1}{4}x^{12} - \frac{7}{3}x^4 + 8x + C$

- 10) $\int 7x^{-4} dx$ 10) _____
 A) $\left(\frac{7}{3x}\right)^5 + C$ B) $-\frac{7}{3}x^{-3} + C$ C) $-28x^{-5} + C$ D) $\left(\frac{21}{x}\right)^3 + C$

- 11) $\int 5 dx$ 11) _____
 A) 1 B) $\frac{5}{2}x^2 + C$ C) $5x + C$ D) $5 + C$

- 12) $\int 5(t^2 - 5t - 2) dt$ 12) _____
 A) $\frac{5}{2}t^3 - 5t^2 - 2t + C$ B) $\frac{5}{3}t^3 - \frac{25}{2}t^2 - 10t + C$
 C) $5t^3 - 5t^2 - 2t + C$ D) $10t - 5 + C$

Find the most general antiderivative.

13) $\int (4e^{2x} - 7e^{-x}) dx$

13) _____

A) $2e^{2x} - 7e^{-x} + C$

B) $\frac{1}{2}e^{2x} + 7e^{-x} + C$

C) $2e^{2x} + \frac{1}{7}e^{-x} + C$

D) $2e^{2x} + 7e^{-x} + C$

Find the integral.

14) $\int \left[5e^x - \frac{1}{x} \right] dx$

14) _____

A) $5e^x - \ln|x| + C$

B) $5e^x - \frac{2}{x^2} + C$

C) $5xe^x - \ln|x| + C$

D) $5e^x - \frac{1}{2x^2} + C$

Evaluate the integral.

15) $\int_{-1}^1 (3x^2 - 8x) dx$

15) _____

A) 7

B) -7

C) 12

D) 2

16) $\int_0^{16} 3\sqrt{x} dx$

16) _____

A) 128

B) 192

C) 24

D) 288

17) $\int_{-1}^5 5x^4 dx$

17) _____

A) -3126

B) 15,630

C) 126

D) 3126

Evaluate the definite integral to two decimal places.

18) $\int_1^5 e^t dt$

18) _____

A) 145.69

B) 2.71

C) 147.41

D) 0.99

Solve the problem.

19) Find the cost function if the marginal cost function is $C'(x) = 18x - 12$ and the fixed cost is \$4.

19) _____

A) $C(x) = 18x^2 - 12x + 3$

B) $C(x) = 18x^2 - 12x + 4$

C) $C(x) = 9x^2 - 12x + 3$

D) $C(x) = 9x^2 - 12x + 4$

20) The marginal revenue from the sale of compact discs is given by $R'(x) = 190 - 8x$ and $R(0) = 0$, where $R(x)$ is the revenue in dollars. Find the revenue equation.

20) _____

A) $R(x) = 190x - 4x^2$

B) $R(x) = 190x - 8x^2$

C) $R(x) = 190 - 4x^2$

D) $R(x) = 190x - 8$

Answer Key

Testname: REVIEW_TEST4

- 1) A
- 2) C
- 3) B
- 4) B
- 5) C
- 6) B
- 7) A
- 8) C
- 9) C
- 10) B
- 11) C
- 12) B
- 13) D
- 14) A
- 15) D
- 16) A
- 17) D
- 18) A
- 19) D
- 20) A