Curve sketching: increasing, decreasing and local extrema worksheet – Grade 12

Grade 12 · Mixed level · 20 questions · **Version X8797**

Name: _____ Date: _____ Score: ___ / 20

Scan to check answers + earn stars

Done the worksheet? Scan the code (or enter version X8797 on this skill's page at themathmeridian.com) to check your answers online and earn stars.

1. What is the critical numbers of $f(x) = x^3 + 6x^2 + 6$? Type both, separated by a comma.

   Answer: _____

2. On which intervals is $f(x) = -x^3 + 3x^2 + 45x + 6$ decreasing?

   A. x ≤ −3 or x ≥ 5 **B.** −3 ≤ x ≤ 5 **C.** x < −3 or x > 5 **D.** −3 < x < 5

3. Work out the critical numbers of $f(x) = x^3 + 9x^2 + 15x - 2$. Type both, separated by a comma.

   Answer: _____

4. Find the critical numbers of $f(x) = x^3 - 9x^2 - 21x + 7$. Type both, separated by a comma.

   Answer: _____

5. On which intervals is $f(x) = x^3 - 6x^2 - 63x + 12$ increasing?

   A. x ≤ −3 or x ≥ 7 **B.** −3 < x < 7 **C.** x < −3 or x > 7 **D.** −3 ≤ x ≤ 7

6. Find the critical numbers of $f(x) = x^3 + 3x^2 - 105x + 8$. Type both, separated by a comma.

   Answer: _____

7. Work out the critical numbers of $f(x) = 2x^3 + 30x^2 + 126x - 7$. Type both, separated by a comma.

   Answer: _____

8. What is the local maximum point of $f(x) = x^3 - 75x - 11$? Type it as (x, y).

   Answer: _____

The Math Meridian

© The Math Meridian · themathmeridian.com · Free for personal and classroom use

9. On which intervals is $f(x) = 3x^4 + 12x^3 - 60x^2 + 7$ increasing?

   A. x < −5 or 0 < x < 2 **B.** −5 ≤ x ≤ 0 or x ≥ 2 **C.** x ≤ −5 or 0 ≤ x ≤ 2

   D. −5 < x < 0 or x > 2

10. Find the local maximum point of $f(x) = x^3 - 6x^2 - 36x - 1$. Type it as (x, y).

    Answer: _____

11. Find the local minimum value of $f(x) = x^3 + 15x^2 + 63x - 7$.

    Answer: _____

12. What is the local minimum value of $f(x) = 2x^3 - 294x - 2$?

    Answer: _____

13. Work out the local maximum point of $f(x) = x^3 - 3x^2 - 72x + 10$. Type it as (x, y).

    Answer: _____

14. Work out the local minimum value of $f(x) = -x^3 + 9x^2 + 21x$.

    Answer: _____

15. Find the maximum value of $f(x) = \dfrac{10x}{x^2 + 64}$. (Give a fraction if needed.)

    Answer: _____

16. What is the maximum value of $f(x) = 6xe^{-x/7}$, to two decimal places?

    Answer: _____

17. What are the asymptotes of $f(x) = \dfrac{2x + 4}{x - 6}$?

    A. x = −6 and y = 2 **B.** x = 6 and y = 4 **C.** x = 6 and y = 2 **D.** x = 2 and y = 6

18. Find the maximum value of $f(x) = 4xe^{-x/6}$, to two decimal places.

    Answer: _____

19. Work out the maximum value of $f(x) = \dfrac{10x}{x^2 + 9}$. (Give a fraction if needed.)

    Answer: _____

20. What is the maximum value of $f(x) = \dfrac{7x}{x^2 + 36}$? (Give a fraction if needed.)

    Answer: _____

The Math Meridian

Answer key · Version X8797

Curve sketching: increasing, decreasing and local extrema worksheet – Grade 12 · Grade 12 · to reprint this sheet or check the answers, enter X8797 on the skill page.

1. **-4,0**
2. **C (x < −3 or x > 5)**
3. **-5,-1**
4. **-1,7**
5. **C (x < −3 or x > 7)**
6. **-7,5**
7. **-7,-3**
8. **(-5, 239)**
9. **D (−5 < x < 0 or x > 2)**
10. **(-2, 39)**
11. **-88**
12. **-1374**
13. **(-4, 186)**
14. **-11**
15. **5/8**
16. **15.45**
17. **C (x = 6 and y = 2)**
18. **8.83**
19. **5/3**
20. **7/12**

The Math Meridian