

1.4 Polynomial Functions and Rates of Change

AP Precalculus

Solutions

1.4 Practice

Find the leading coefficient and the degree of each polynomial.

1. $f(x) = 8x^4 - 4x^3 + 6x^2 + 10$

L.C. 8 Degree: 4

2. $f(x) = 8x^2 - 3x$

L.C. 8 Degree: 2

3. $f(x) = -5x^7 + 6x^4 - x$

L.C. -5 Degree: 7

4. $f(x) = 3x^4 + 10x^5 - 8x^3 + 1$

L.C. 10 Degree: 5

5. $f(x) = 5x^3 - 9x^2 + x^7 - 3x^8$

L.C. -3 Degree: 8

6. $f(x) = 9x^6 - 2x^7$

L.C. -2 Degree: 7

Let $f(x)$ be a polynomial function with the given values. Are there any guaranteed extrema? If so, state where they occur.

7. $f(-1) = 0, f(0) = 6,$ and $f(6) = 0.$

Yes, on the interval $-1 < x < 6.$

8. $f(0) = 6, f(3) = 2, f(6) = 0,$ and $f(10) = 0.$

Yes, on the interval $6 < x < 10.$

9. $f(-5) = 0, f(0) = 5,$ and $f(5) = 7.$

No guarantee.

Is there an absolute maximum or minimum for each function?

10. $f(x) = 2x^8 - x^3 + x^2 + 6$

Even degree, positive leading coefficient = opens up.

minimum



11. $f(x) = -3x^4 + 5x - 1$

Even degree, negative leading coefficient = opens down.

maximum



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

Odd degree

No absolute max or min

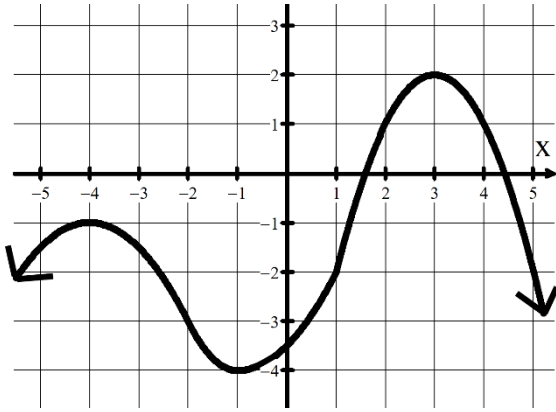
13. $f(x) = -4x^6 - 10x^2 - 7$

Even degree, negative leading coefficient = opens down.

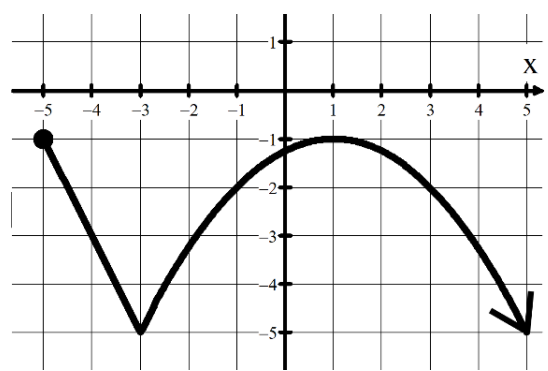
maximum



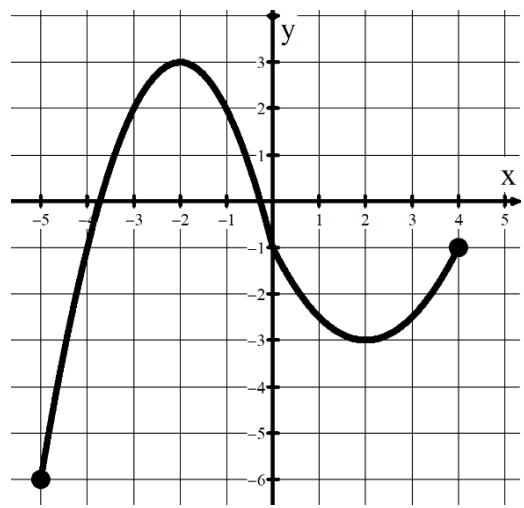
Find the following extrema. If there are none, cross it off and write NONE.



- 14. ~~Absolute min of _____ when x =~~ none
- 15. Absolute max of 2 when x = 3
- 16. Relative min(s) at x = -1
- 17. Relative max(es) at x = -4 and 3



- 18. ~~Absolute min of _____ when x =~~ none
- 19. Absolute max of -1 when x = -5 and 1
- 20. Relative min(s) at x = -3
- 21. Relative max(es) at x = -5 and 1



- 22. Absolute min of -6 when x = -5
- 23. Absolute max of 3 when x = -2
- 24. Relative min(s) at x = -5 and 2
- 25. Relative max(es) at x = -2 and 4