

Extrema and First Derivative Test

In problems 1-6, Find all relative extrema of the function.

1. $f(x) = 3x^2 - 12x + 1$	2. $f(x) = -x^2 + 6x - 3$
3. $f(x) = 2x^3 - 15x^2 - 144x + 12$	4. $f(x) = (x^2 - 25)^3$
5. $f(x) = x^{2/5} + 3$	6. $f(x) = \sqrt[3]{x^2 - 4}$

In problems 7-9, Use a graphing utility to find graphically all relative extrema of the function.

7. $f(x) = x^3 + 2x^2 - 4x + 2$	8. $f(x) = x - \frac{1}{x^2}$
9. $f(x) = \frac{x-3}{x^2-4}$	

In problems 10-15, Find the absolute extrema of the function on the closed interval.

10. $f(x) = 3x - 1, [-3, 2]$	11. $f(x) = x^2 - 4x + 1, [0, 5]$
12. $f(x) = 2x^3 - 3x^2 - 36x + 6, [-6, 2]$	13. $f(x) = x^4 - 18x^2, [-5, 2]$
14. $f(x) = \frac{x+1}{x-3}, [-1, 6]$	15. $f(x) = (x^2 - 9)^{4/3}, [-4, 2]$