> Problems 12.2: The Second Derivative Test for Local Extrema

Use the second derivative test to determine the local extrema of the following functions. Locate and label all critical numbers. Show any tests, diagrams or reasoning you have used.

1. $f(x) = 2x^2 + 3x + 7$

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

3. $f(x) = \frac{1}{3}x^3 - 2x^2 - 5x - 10$

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

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

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

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

8. $f(x) = x + \dfrac{9}{x}$

9. $f(x) = \dfrac{1}{x^2+9}$

10. $f(x) = \dfrac{x}{1-x}$

11. $f(x) = \dfrac{x}{1+x^2}$

12. $f(x) = \dfrac{x^2}{x^2+1}$