MCS22 Homework 3

In 1 – 9, for each function, use calculus techniques to determine:

(a) intervals where f is increasing and/or decreasing

(b) coordinates of relative maxima and/or relative minima

(c) intervals where f is concave up and/or concave down

(d) coordinates of point(s) of inflection

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

2. $f(x) = x^4 - 18x^2$

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

4. $f(x) = x^4 - 8x^3$

5. $f(x) = x + \frac{9}{x}$

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

7. $f(x) = \frac{x-1}{x+2}$

8. $f(x) = \frac{x^2}{x^2-1}$

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

10. Find the absolute minimum and absolute maximum of $y = x^2 - 4$ on the interval [-1, 3].

11. Find the absolute minimum and absolute maximum of $y = x^3 - 6x^2$ on the interval [-1, 7].