

- (a) $f(x) = 4x^3 + 3x^2 - 6x + 2 \Rightarrow f'(x) = 12x^2 + 6x - 6 = 6(2x^2 + 1x - 1) = 6(2x - 1)(x + 1)$.
Thus, $f'(x) > 0 \Leftrightarrow x < -1$ or $x > 0.5$ and $f'(x) < 0 \Leftrightarrow -1 < x < 0.5$. So f is increasing on $(-\infty, -1)$ and $(0.5, \infty)$ and f is decreasing on $(-1, 0.5)$.
- (b) f changes from increasing to decreasing at $x = -1$ and from decreasing to increasing at $x = 0.5$. Thus, $f(-1) = 7$ is a local maximum value and $f(0.5) = 0.25$ is a local minimum value.
- (c) $f''(x) = 24x + 6 = 6(4x + 1)$. $f''(x) > 0 \Leftrightarrow x > -0.25$ and $f''(x) < 0 \Leftrightarrow x < -0.25$. Thus, f is concave upward on $(-0.25, \infty)$ and concave downward on $(-\infty, -0.25)$. There is an inflection point at $(-0.25, f(-0.25)) = (-0.25, 3.625)$.