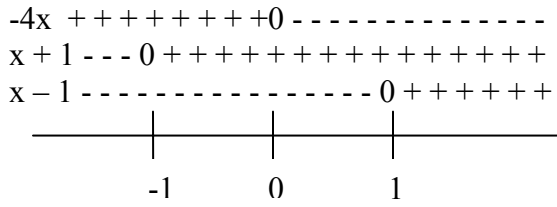


$$f(x) = -x^4 + 2x^2 + 4$$

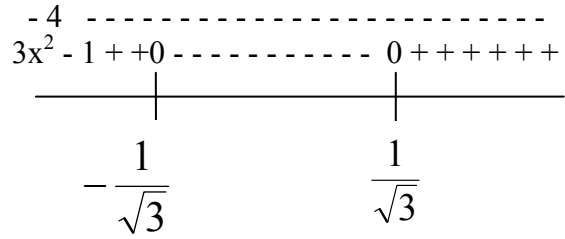
$$f'(x) = -4x^3 + 4x = -4x(x^2 - 1) = -4x(x+1)(x-1)$$

So we have critical points at $x = -1, 0, 1$



f is increasing on $(-\infty, -1)$ and $(0, 1)$
 f is decreasing on $(-1, 0)$ and $(1, +\infty)$
 f has a relative minimum of 4 at $x = 0$
 f has a relative maximum of 5 at $x = \pm 1$

$$f''(x) = -12x^2 + 4 = -4(3x^2 - 1)$$



f is concave down on $(-\infty, -\frac{1}{\sqrt{3}})$ and $(\frac{1}{\sqrt{3}}, +\infty)$
 f is concave up on $(-\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}})$
 f has an inflection points of $(-\frac{1}{\sqrt{3}}, \frac{41}{9})$ and $(\frac{1}{\sqrt{3}}, \frac{41}{9})$

