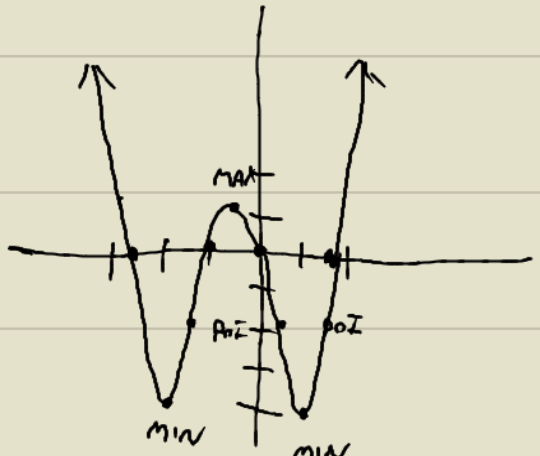
2. $f(x) = x^4 + 2x^3 - 3x^2 - 4x$

DOMAIN: $(-\infty, \infty)$



X-INT: $0 = x^4 + 2x^3 - 3x^2 - 4x$

$0 = x(x^3 + 2x^2 - 3x - 4)$

$x = 0$ $\quad x^3 + 2x^2 - 3x - 4 = 0$

$x = -1, -2.6, 1.6$

$-1 \;|\; 1 \;\; 2 \;\; -3 \;\; -4$

$\quad\quad -1 \;\; -1 \;\; 4$

$1 \;\; 1 \;\; -4 \;\; 0$

$x^2 + x - 4 = 0$

$a=1 \quad b=1 \quad c=-4$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{-1 \pm \sqrt{1^2-4(1)(-4)}}{2(1)}$

$x = \frac{-1 \pm \sqrt{17}}{2}$

Y-INT

$y = 0^4 + 2(0)^3 - 3(0)^2 - 4(0)$

$y = 0$

ASYMPTOTES

NONE

L.C.T.

UP TO LEFT
UP TO RIGHT

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

$f'(x) = 4x^3 + 6x^2 - 6x - 4$

$4x^3 + 6x^2 - 6x - 4 = 0$

$2(2x^3 + 3x^2 - 3x - 2) = 0$

$x = 1, -\frac{1}{2}, -2$

$f''(x) = 12x^2 + 12x - 6$

$12x^2 + 12x - 6 = 0$

$6(2x^2 + 2x - 1) = 0$

$x = 0.4, -1.4$

$-\infty$ $\quad x=-2$ $\quad x=-\frac{1}{2}$ $\quad x=1$ $\quad \infty$

$x=-3$ $\quad x=-1$ $\quad x=0$ $\quad x=2$

MIN $\quad$ MAX $\quad$ MIN

DEC $(-\infty, -2)$ $\quad$ DEC $(-\frac{1}{2}, 1)$

INC $(-2, -\frac{1}{2})$ $\quad$ INC $(1, \infty)$

MIN $(-2, -4)$

MAX $(-\frac{1}{2}, 1.1)$

MIN $(1, -4)$

$-\infty$ $\quad x=-1.4$ $\quad x=0.4$ $\quad \infty$

$x=-2$ $\quad x=0$ $\quad x=1$

$2x^2+2x-1$ $\quad 2x^2+2x-1$ $\quad 2x^2+2x-1$

POI $\quad$ POI

CONC UP $(-\infty, -1.4)$ $\quad$ CONC UP $(0.4, \infty)$

CONC DOWN $(-1.4, 0.4)$

POI

$(-1.4, -1.9)$

$(0.4, -1.9)$