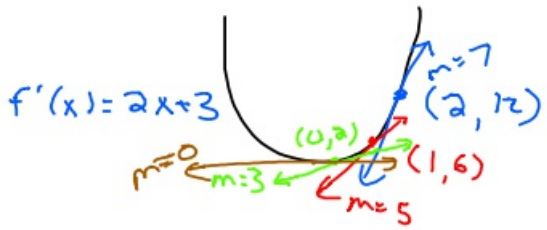
1-28-20 1st Trig

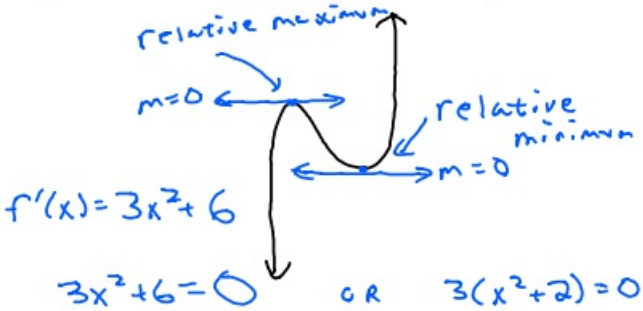
A.B
RQ2
2-4

① $f(x) = x^2 + 3x + 2$

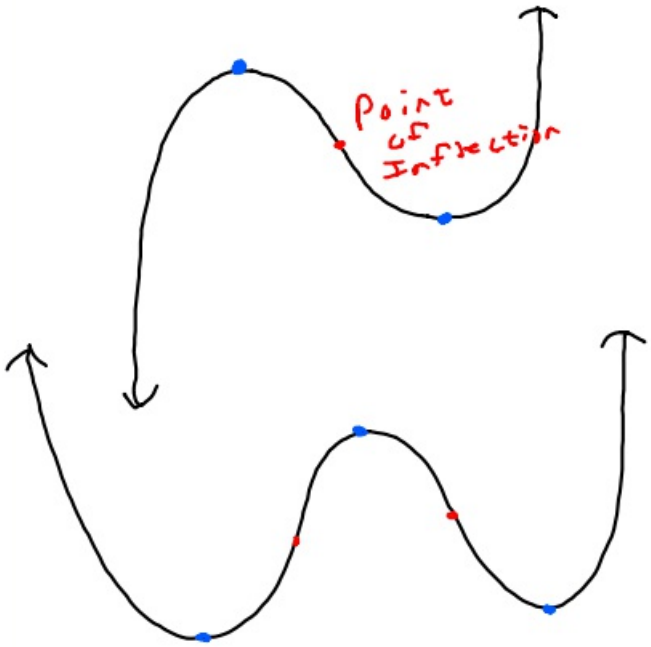


$2x + 3 = 0$
$-3 \quad -3$
$2x = -3$
$x = -1.5$

② $f(x) = x^3 + 6x + 1$

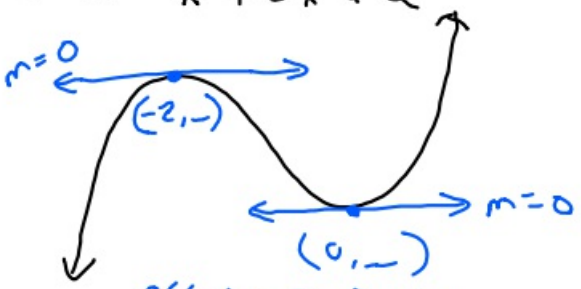


$3x^2 + 6 = 0$ OR $3(x^2 + 2) = 0$
$-6 \quad -6$
$\frac{3x^2}{3} = \frac{-6}{3}$
$x^2 = -2$



③ Find the relative maximum and minimum of

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



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

$3x^2 + 6x = 0$

$3x(x+2) = 0$

$3x = 0$ $\quad$ $x+2=0$

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

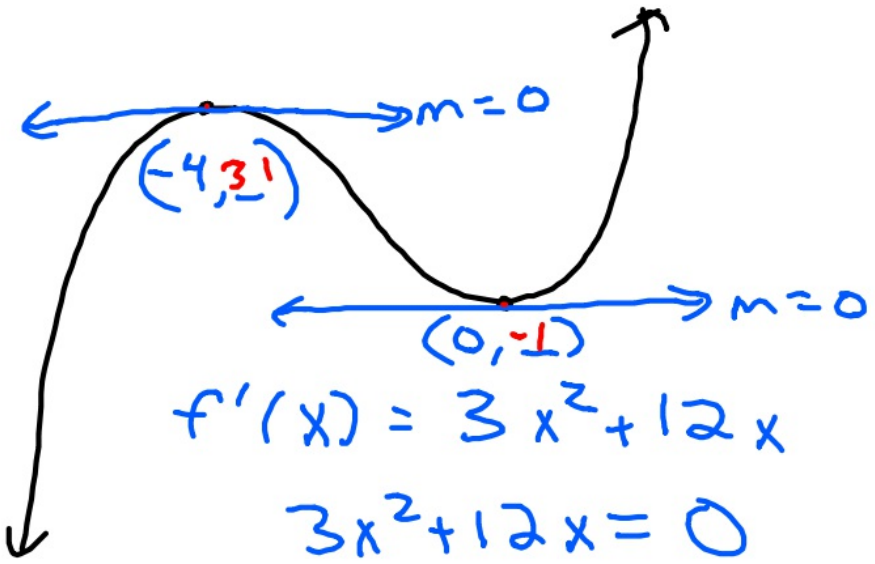
Plug these values back into the ORIGINAL EQUATION

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

$f(0) = 0^3 + 3(0)^2 + 2 = 2$ min $(0, 2)$

$f(-2) = (-2)^3 + 3(-2)^2 + 2 = -12$ max $(-2, 6)$

(4) Find relative maximum and minimum of $f(x) = x^3 + 6x^2 - 1$.



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

$3x^2 + 12x = 0$

$3x(x+4) = 0$

$3x = 0$ $\quad$ $x+4 = 0$

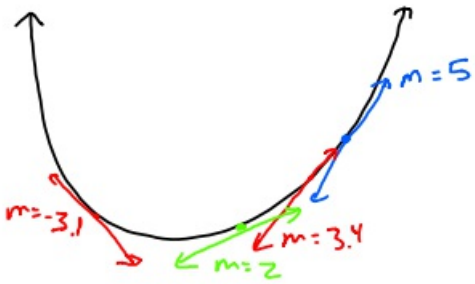
$x = 0$ $\quad$ $x = -4$

Plug these x's back into the original equation of $f(x) = x^3 + 6x^2 - 1$.

$f(0) = 0^3 + 6(0)^2 - 1 = -1$ $\quad$ $(0, -1)$ min.

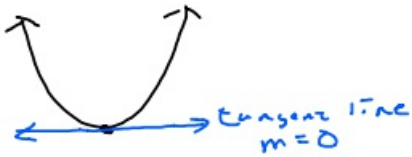
$f(-4) = (-4)^3 + 6(-4)^2 - 1 = 31$ $\quad$ $(-4, 31)$ max

1-28-20 3rd Trig



① Find the vertex of

$f(x) = x^2 + 8x + 2$

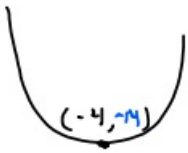


$f'(x) = 2x + 8$

When does $2x + 8 = 0$

$x = -4$

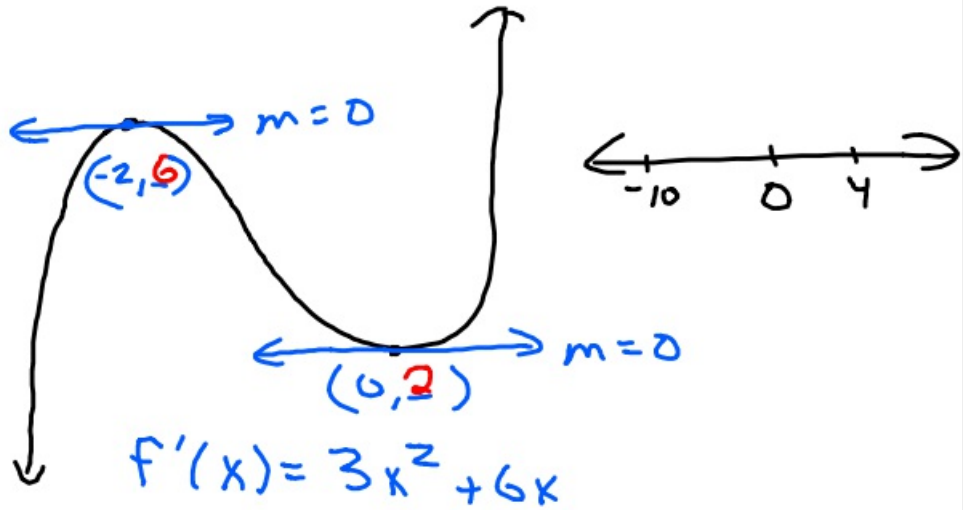
Tangent line has a slope of zero at $x = -4$



$f(x) = x^3$

② Find the relative maximum and minimum of

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



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

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

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

$$3x = 0 \qquad x + 2 = 0$$

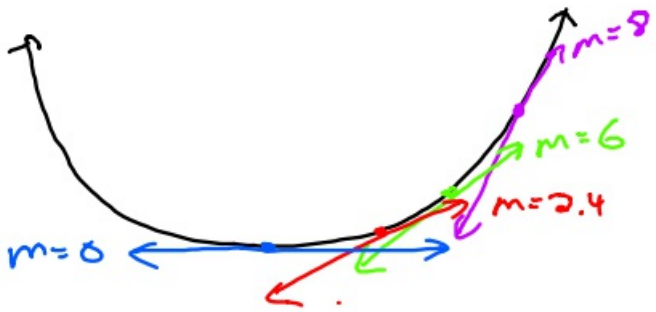
$$x = 0 \qquad x = -2$$

Plug these x values back into the ORIGINAL EQUATION. which was $f(x) = x^3 + 3x^2 + 2$

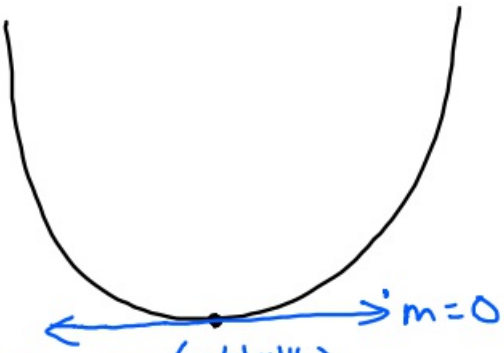
$f(0) = 0^3 + 3(0)^2 + 2 = 2$ (0,2) min.

$f(-2) = (-2)^3 + 3(-2)^2 + 2 = 6$ (-2,6) max.

1-28-20 4th Trig



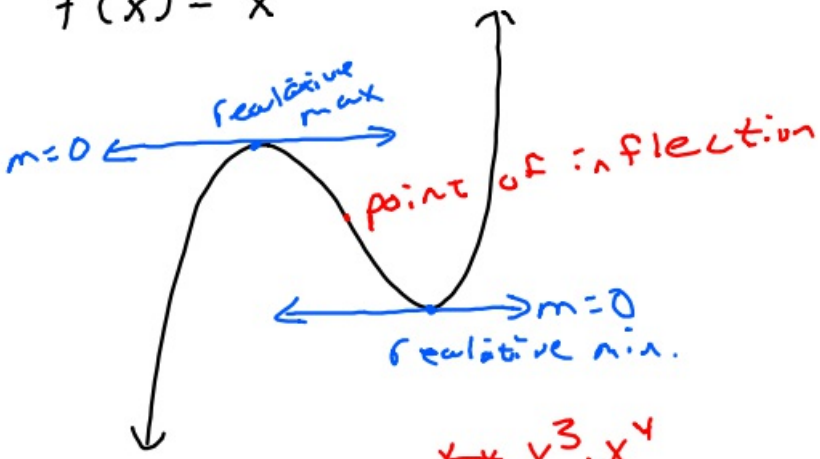
$f(x) = x^2 + 8x + 2$



$f'(x) = 2x + 8$

$2x + 8 = 0$
$-8 \quad -8$
$2x = -8$
$x = -4$

$f(x) = x^3$

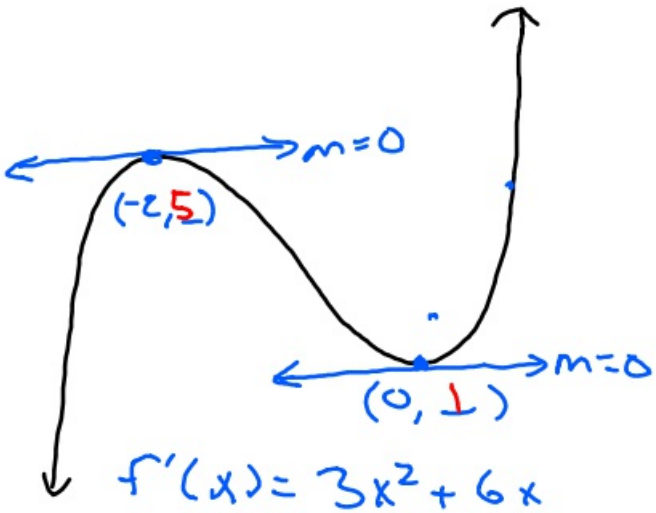


~~$x^3 \cdot x^4$~~

XXX XXXX

① Find the realative maximum and minimum of

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



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

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

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

$$3x = 0 \qquad x+2 = 0$$

$$x = 0 \qquad x = -2$$

To find the y value, plug your x values into the ORIGINAL EQUATION.

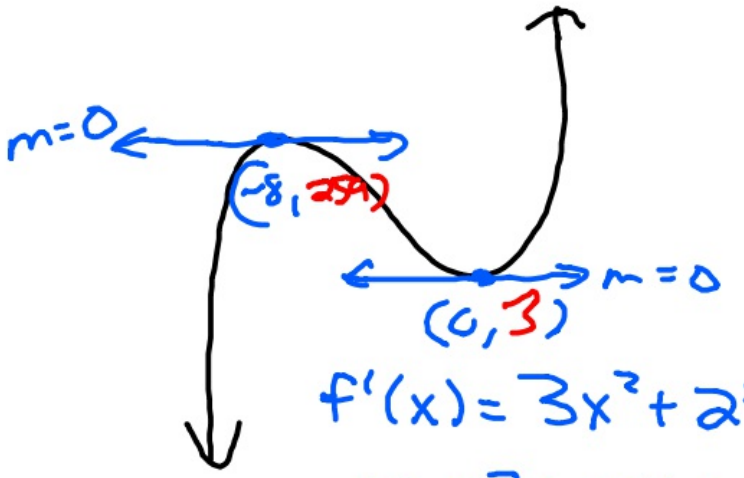
$$f(x) = x^3 + 3x^2 + 1$$

$f(0) = 0^3 + 3\cdot 0^2 + 1 = 1$ (0,1)

$f(-2) = (-2)^3 + 3(-2)^2 + 1 = 5$ (-2,5)

② Find the relative maximum and minimum of

$$f(x) = x^3 + 12x^2 + 3$$



$$f'(x) = 3x^2 + 24x$$

$$3x^2 + 24x = 0$$

$$3x(x+8) = 0$$

$3x = 0$ $\qquad$ $x + 8 = 0$

$x = 0$ $\qquad$ $x = -8$

Original $f(x) = x^3 + 12x^2 + 3$

$f(0) = 0^3 + 12(0)^2 + 3 = 3$ $\quad (0, 3)$

$f(-8) = (-8)^3 + 12(-8)^2 + 3 = 259$ $\quad (-8, 259)$