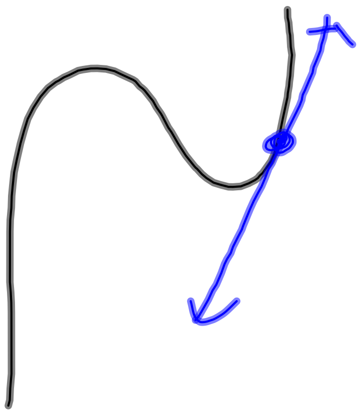
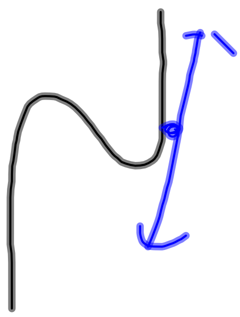
3-12-14

3rd Trig



① $f(x) = x^3 + 6x$

Give the equation of the line that is tangent to this guy at (1,7).



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

$f'(1) = 3\cdot 1^2 + 6 = 9$

$m = 9$

$y - y_1 = m(x - x_1)$

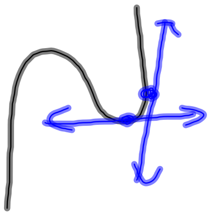
$y - 7 = 9(x - 1)$

$y - 7 = 9x - 9$

$\quad +7 \qquad +7$

$y = 9x - 2$

Give the equation of the line that is tangent to $f(x)=2x^3-6x$ at the point $(1,-4)$



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

$f'(1) = 6\cdot 1^2 - 6$

$m = 0$

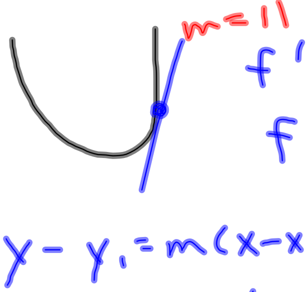
$y - y_1 = m(x - x_1)$

$y - -4 = 0(x - 1)$

$y + 4 = 0$

$y = -4$

Give the equation of the line that is tangent to $f(x)= 3x^2 - x$ at the point $(2, 10)$.



$f'(x) = 6x - 1$

$f'(2) = 6\cdot 2 - 1 = 11$

$m = 11$

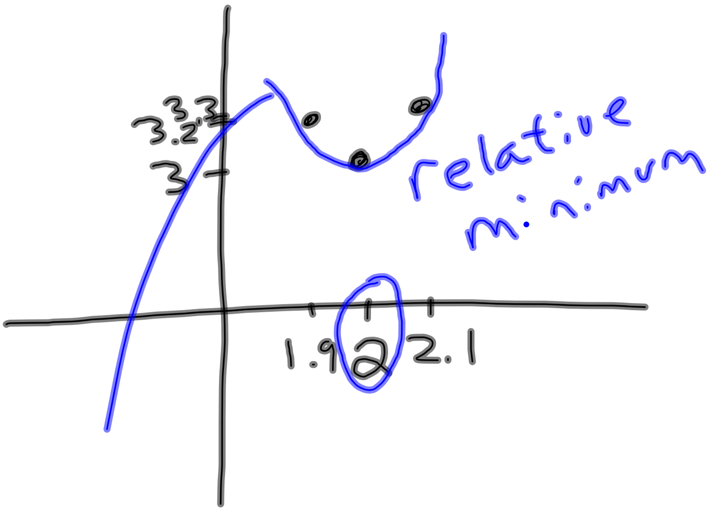
$y - y_1 = m(x - x_1)$

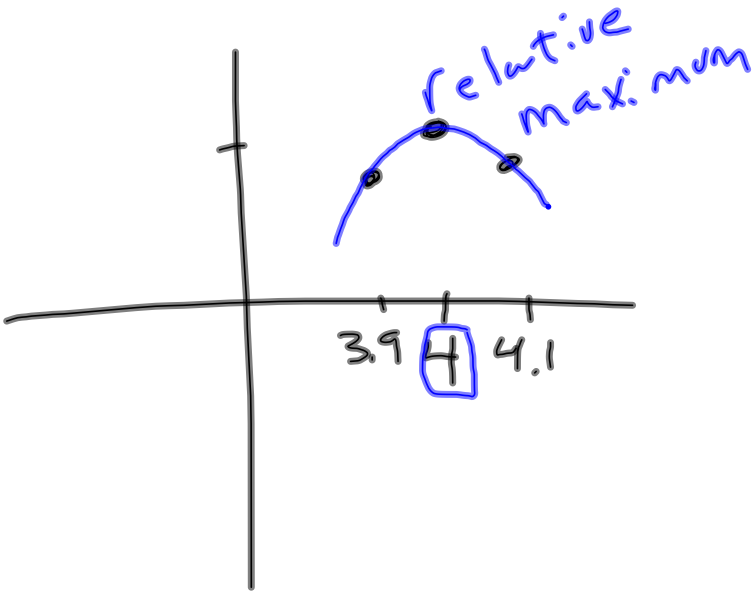
$y - 10 = 11(x - 2)$

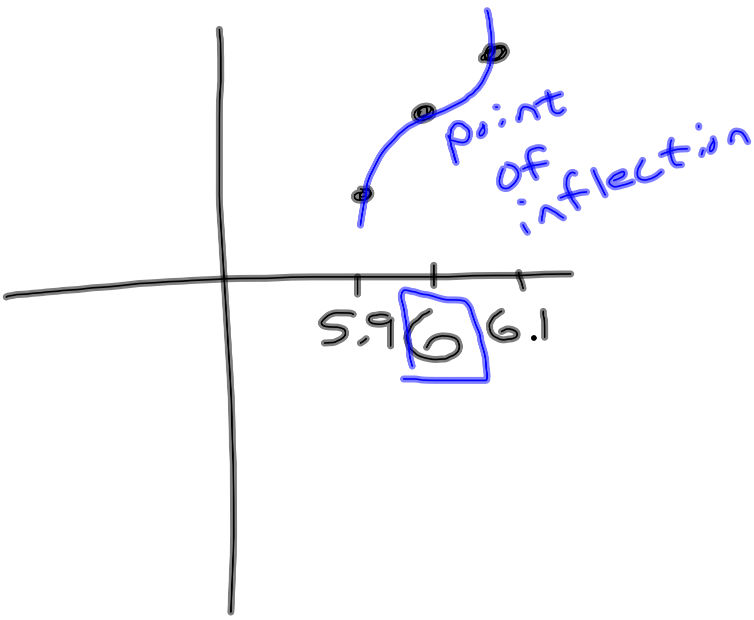
$y - 10 = 11x - 22$

$+10 \qquad +10$

$y = 11x - 12$


3.3
3.2
3
relative minimum
1.9
2
2.1


relative maximum
3.9
4
4.1

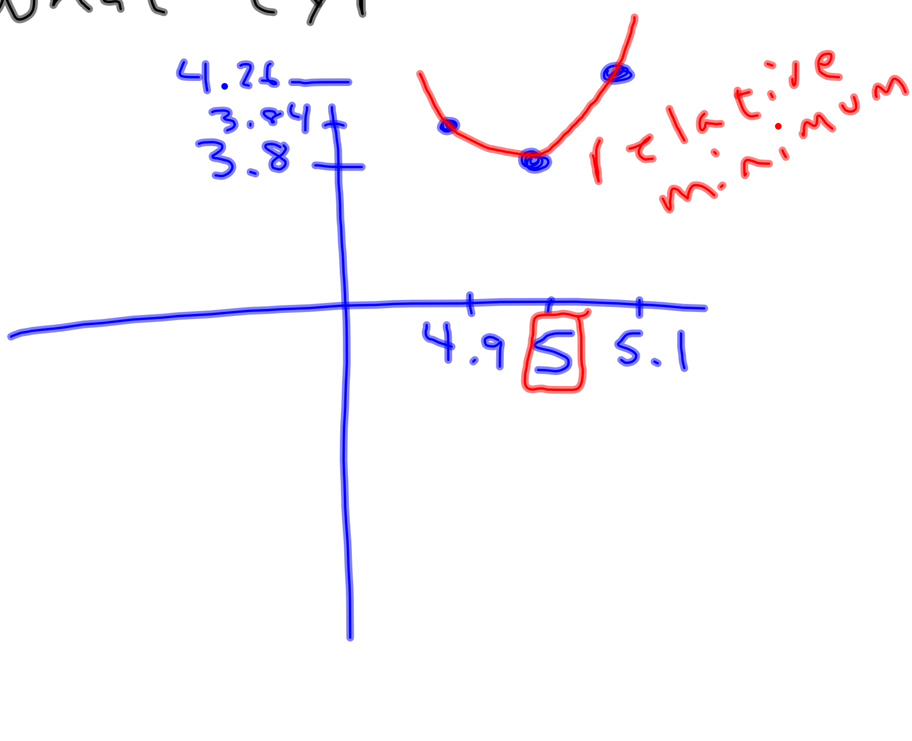

point of inflection
5.9
6
6.1

$f(5) = 3.8$

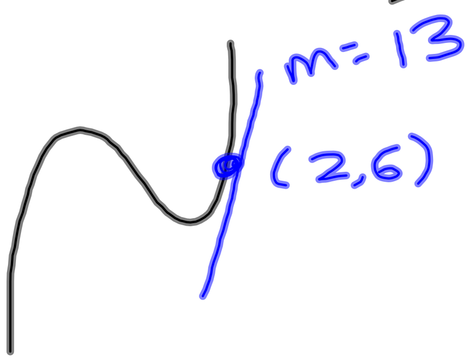
$f(4.9) = 3.84$

$f(5.1) = 4.26$

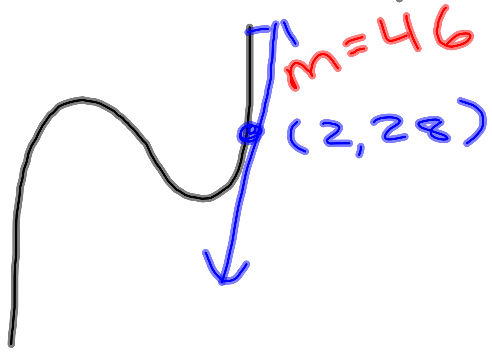
If $x = 5$ is a critical point, what type is it?



3-12-14
4th Trig



① Give the equation of the line that is tangent to $f(x) = 4x^3 - 2x$ at the point $(2, 28)$.



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

$f'(2) = 46$

$m = 46$

$y - y_1 = m(x - x_1)$

$y - 28 = 46(x - 2)$

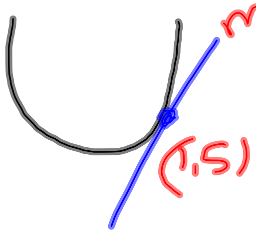
$y - 28 = 46x - 92$

$+28 \qquad +28$

$y = 46x - 64$

② Give the equation of the line that is tangent to $f(x) = 6x^2 - x$ at the point $(1,5)$.

$m = 11$



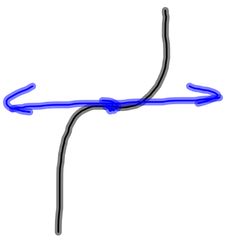
$f'(x) = 12x - 1$

$f'(1) = 12 \cdot 1 - 1 = 11$

$y - 5 = 11(x - 1)$

$$\begin{array}{l} y - 5 = 11x - 11 \\ \underline{\;\;+5 \qquad\quad +5\;\;} \\ y = 11x - 6 \end{array}$$

Give the equation of the line that is tangent to $f(x) = x^3$ at the point $(0,0)$



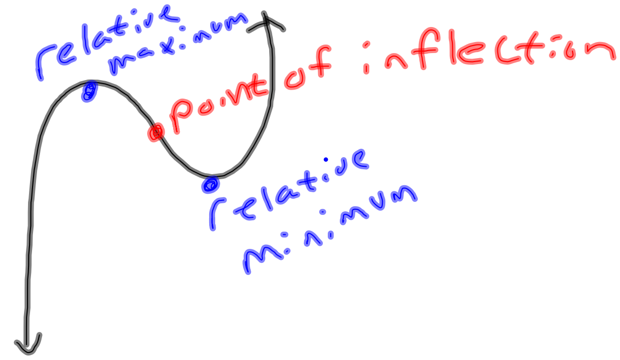
$f'(x) = 3x^2$

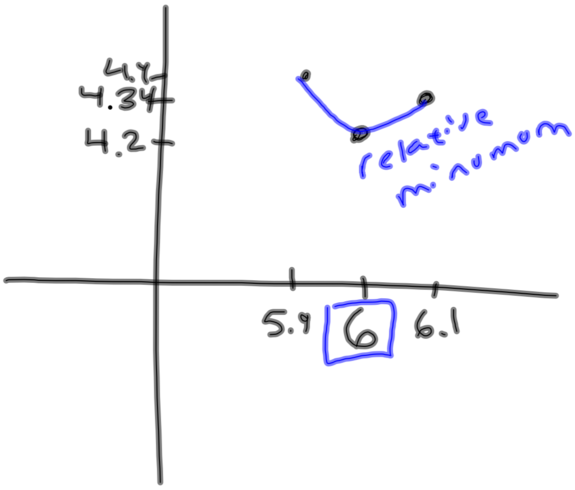
$f'(0) = 3 \cdot 0^2 = 0$

$y - y_1 = m(x - x_1)$ $m = 0$

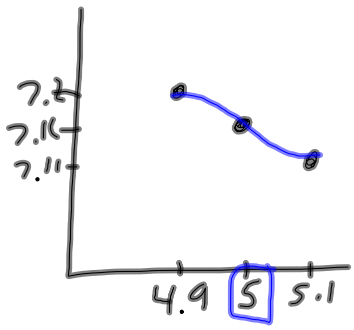
$y - 0 = 0(x - 0)$

$y = 0$





$f(4.9) = 7.20$
$f(5) = 7.16$
$f(5.1) = 7.12$



$f(8) = 1.12$ ← middle
$\therefore$ pt. of inflection
$f(7.9) = 1.24$
$f(8.1) = 1.00$