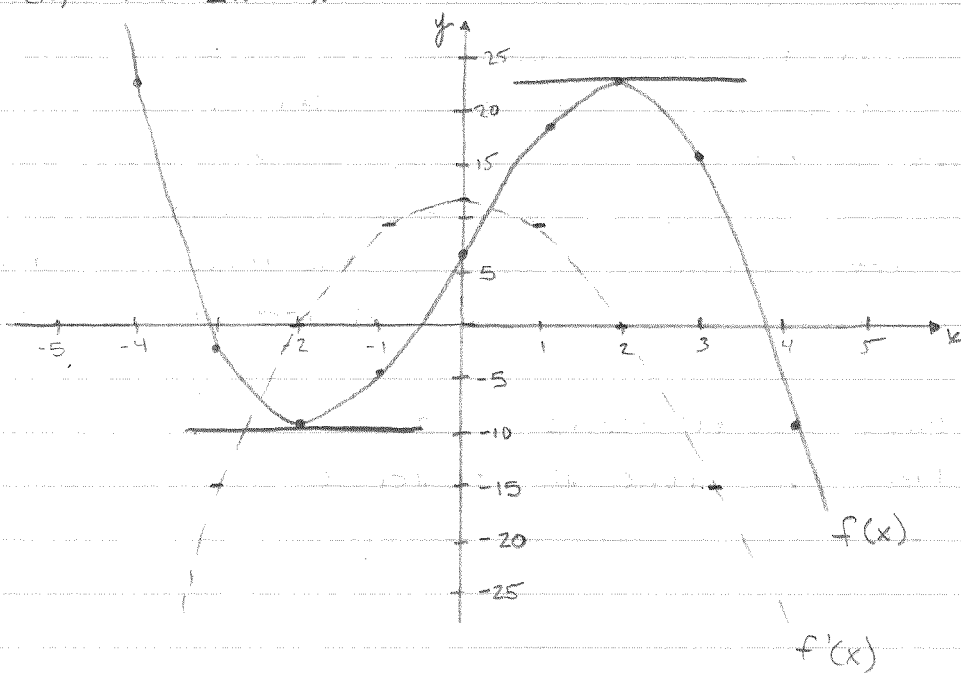


72. $y = f(x) = 7 + 12x - x^3$



estimate tangent to be horizontal at $x = \pm 2$

$$f(x) = 7 + 12x - x^3$$

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

$$0 = 12 - 3x^2$$

$$-12 = -3x^2$$

$$4 = x^2$$

$$\sqrt{4} = x$$

$$\pm 2 = x$$

I plugged the function,

$7 + 12x - x^3$ into the calculator and came up with the above

solid-line graph. I estimated the values, where the tangent was horizontal to the graph to be at -2 and 2 . To

confirm my estimation, I

took the derivative of the function, $7 + 12x - x^3$, and got $12 - 3x^2$. Then I set the derivative,

$12 - 3x^2$, equal to zero and solved for x . After solving for x , I came up with -2 and 2 as the values of zero for the derivative. I then did a second check by graphing the derivative.

The minimum and maximum values on the function graph represent the zero's on the graph of the derivative. Therefore, by solving for x in the derivative function by setting the derivative equal to zero, I was able to confirm my estimation relating to the horizontal tangents.