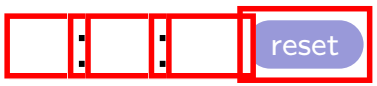
# Bellwork 11/14

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

Explain why $f$ satisfies the MVT on $x \in [0, 1]$.

Then, find the $x$-values that satisfy the conclusion of the MVT on this interval.



# Bellwork 11/14 - Solution

$$f'(a) = \frac{f(1) - f(0)}{1 - 0}$$

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

$$x^2 = \frac{2}{3}x$$

$$\boxed{x = 0, \frac{2}{3}}$$

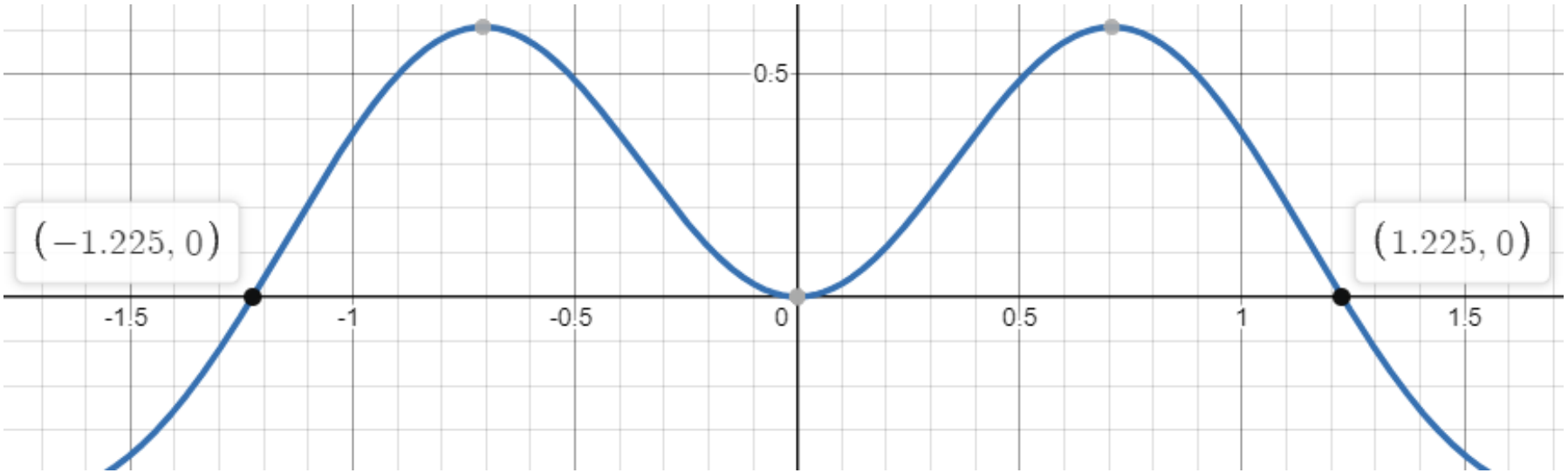
# Exercise 1

$$g(x) = x^3 e^{-x^2}$$

Determine the local extrema of $g$ by using the First Derivative Test and a graphing calculator.

# Exercise 1 - Solution

Graph of $g'(x)$:




Because $g'(x)$ changes signs at $x = -1.225$, $1.225$, local extrema are $g(-1.225)$ and $g(1.225)$.

$$g(-1.225) = -0.410;\ g(1.225) = 0.410$$

| Local Maximum: 0.410; Local Minimum: $-0.410$ |
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