

Week 4 FRQ

- 1) a) Use the limit definition of derivative to find the slope of the tangent line of $f(x) = 12x - x^3$ at any point.
- b) Find the points (x and y-values) where the slope of the tangent line is horizontal.
- c) Find the point(s) where the slope of the tangent line is equal to 4.
- 2) a) Use the limit definition of derivative to find the slope of the tangent line of $y = x^3$ at any point.

b) Use the limit definition of derivative to find the slope of the tangent line of $y=x^2+5x$ at any point.

c) Find the values of x where $y=x^3$ and $y=x^2+5x$ have parallel tangent lines.

3) a) Use the limit definition of derivative to find the slope of the tangent line of $y=4x^2+11x+2$ at any point.

b) Find all the values of x such that the tangent line to $y=4x^2+11x+2$ is steeper than the tangent line to $y=x^3$.

c) The graph of $y=4x^2+11x+2$ is sketched here. If you wanted to find the x -value of the minimum, what would you set the derivative equal to and why?

