

In the space provided, please write your solution to the following exercises. Show all of your work and not just the final conclusion. Remember to use good notation. The majority of the credit you receive will be based on the completeness and the clarity of your responses.

1. Let $f(x) = 2x^2 + 10x$.

(a) (5 points) Find $f'(x)$ using the limit definition.

(b) (2 points) Use part (a) to verify that $f'(3) = 22$.

(c) (3 points) Find an equation of the tangent line to the curve $y = f(x)$ at the point $a = 3$.

Bonus: (2 points) Calculate the derivative of $f(x) = 9 - 12x^{\frac{1}{3}} + 8e^x$.