

Name: \_\_\_\_\_

Grade: \_\_\_\_\_

Group Members Present:

\_\_\_\_\_, \_\_\_\_\_, & \_\_\_\_\_

1. Use the definition of derivative to develop a formula for the derivative of  $f(x) = 4x^2 - 5$ .

Step 1: Write the point at  $x$

Step 2: Write a point close to  $x$ , using  $x + h$

Step 3: Write the slope of the secant through the two points identified in steps 1 and 2.

Simplify the slope formula.

Step 4: Calculate the limit of the slopes as  $x + h$  approaches  $x$ .

Write the formula for the derivative of  $f$ .

2.  $P(x) = 3x^2 - x + 8$  million dollars gives the profit of a company  $x$  years after 2000.

a. Use the definition of derivative to develop a formula for the derivative of  $P$ .

Step 1:

Step 2:

Step 3:

Step 4:

b. Evaluate  $P'(5)$ .

c. Interpret the result of part b.

d. Find the percentage rate of change of  $P$  at  $x = 5$ .