Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.3: The Product, Reciprocal and Quotient Rules

Activity 1:

Part 1: For each of the following scenarios, draw a diagram to visualize how to find the new y value:

|  |  |
| --- | --- |
| 1. Initial point , slope = 3, find the value of when . | 1. Initial point , slope = , find the value of when . |
| 1. Initial point , slope = 5, find the value of when . | 1. Initial point , slope = , find the value of when . |

Part 2: Generalize these examples to raw a diagram to make sense of the general formula

Activity 2

Part 1. Given and initial point : Without finding the formula of the tangent line, use the formula for linear approximations to approximate the following using the tangent line at *:*

Part 2: Generalize these examples to draw a diagram showing and a linear approximation to make sense of the general formula and indicate when this linear approximation will become precise.

Activity 3: Use the approximation and the algebraic definition of the derivative to develop a rule for the derivative of the product of two functions:

Activity 4: Use the approximation and the algebraic definition of the derivative to develop a rule for the derivative of the reciprocal of a function:

Activity 5: Use the product and reciprocal rules to develop the quotient rule:

Activity 6: Practice applying these rules with the online assignment in canvas.