1. Use the definition of the derivative to complete the following.

   (a) Find the slope of the line that is tangent to the graph of $f(x) = \sqrt{x}$ at $x = 1$.

   (b) Find the slope of the line that is tangent to the graph of $f(x) = \sqrt{x}$ at $x = 2$.

   (c) Find the slope of the line that is tangent to the graph of $f(x) = \sqrt{x}$ at $x = 3$.

   (d) Find the slope of the line that is tangent to the graph of $f(x) = \sqrt{x}$ at $x = 4$.

   (e) Find the slope of the line that is tangent to the graph of $f(x) = \sqrt{x}$ at $x = 9$.

2. Use the definition of the derivative to complete the following.

   (a) Find the slope of the line that is tangent to the graph of $f(x) = \frac{1}{x^2}$ at $x = 2$.

   (b) Find the slope of the line that is tangent to the graph of $f(x) = \frac{1}{x^2}$ at $x = a$.

   (c) Is there a point on this curve where the tangent line has slope 16?

   (d) Is there a point on this curve where the tangent line is horizontal?

3. Consider the graph of the hyperbola $y = \frac{1}{x}$. If you draw the tangent line at a point on the graph, it will make a triangle with a section of the x-axis and a section of the y-axis (choosing a different point results in a different triangle). Choose a point and find the area of this triangle – each person in your group should use a different point. What do you observe? Show that your observation is correct.