1 Differentiation

1.1 What is a derivative?

There are several types of interpretations; geometric, physical, philosophical. Differentiation is important to all aspects of measurements (science, engineering, economics, political science, etc.).

Our learning goal is to know how to differentiate **any** function. For example, $\frac{d}{dx} e^{x \arctan x}$.

For a geometric interpretation, we want to find the tangent line to some function, $y = f(x)$ at $P = (x_0, y_0)$:

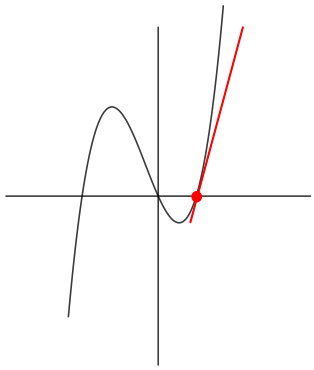

Figure 1: tangent

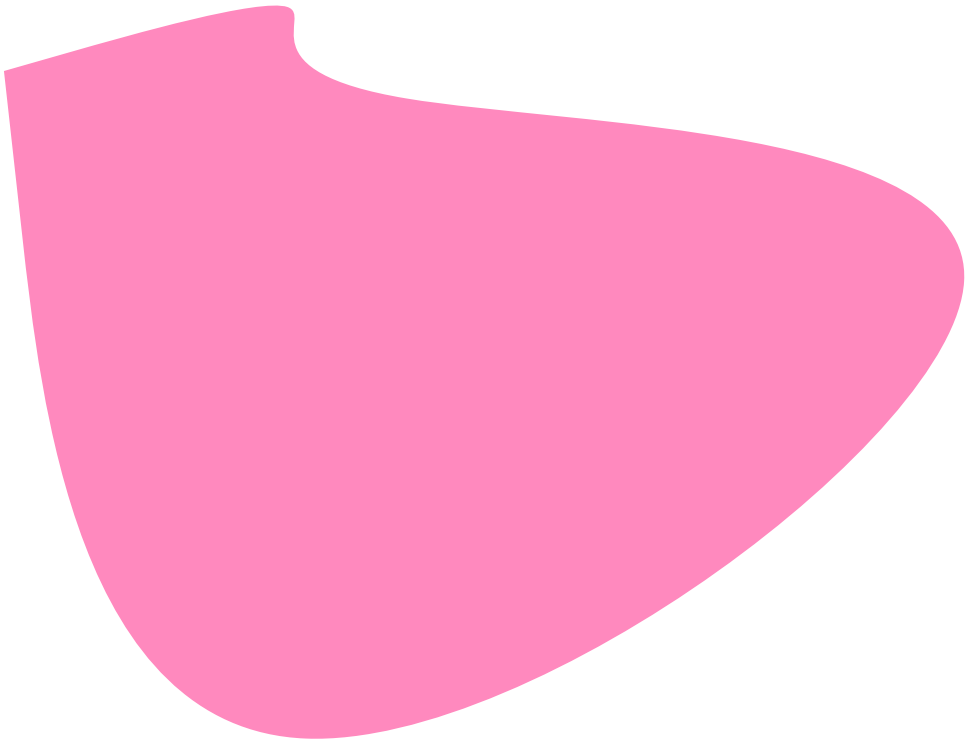

Figure 2: newfig