Successive Approximation in Differentiation

E.g. Find the gradient when x = 1 using first principles.

\[ m = \frac{8}{2} = 4 \]

\[ m = \frac{3}{1} = 3 \]

\[ m = \frac{1 \cdot 25}{0.5} = 2.5 \]

\[ m = \frac{1.25^2 - 1}{0.25} = 2.25 \]

The closer we get to having a tangent, the better the approximation to the gradient.

\[ \Delta y = 8 \]

\[ \Delta y = 1.5^2 - 1 = 1.25 \]

\[ \Delta x = 0.5 \]

\[ \Delta x = 1 \]

\[ \Delta x = 2 \]