Mathematics 1
Mathematics 1 - Lecture

Lect 1

Key Idea

Tangent: $\frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{\Delta y}{\Delta x}$

Example: $\frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x}$

Equation

Example: $\frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x}$

$y \propto x$

$y = \alpha x + b$

Let (x_1, y_1) be known

$y_1 = \alpha x_1 + b$

$y_2 = \alpha x_2 + b$

$y_2 - y_1 = \alpha(x_2 - x_1)$

$y_2 - y_1 = \alpha x_2 + b$

$y_1 = \alpha x_1 + b$

$\alpha = \frac{y_2 - y_1}{x_2 - x_1}$

$b = \frac{x_2 y_1 - x_1 y_2}{x_2 - x_1}$

$\alpha = \frac{\Delta y}{\Delta x}$

$b = \frac{x_2 y_1 - x_1 y_2}{\Delta x}$

$y = \frac{\Delta y}{\Delta x} x + \frac{x_2 y_1 - x_1 y_2}{\Delta x}$

$y = \alpha x + b$

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