MATH127; Formulae

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1 Distance

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

2 Midpoint

$$(x_m, y_m) = (\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$$

3 Pythagorean Theorem

$$a^2 + b^2 = c^2$$

Converse of Pythagorean Theorem states that if the longest side of a triangle equals the sum of the other 2 sides, it is a *right* triangle.

4 General Form

$$ax + by = c$$

5 Slope

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

6 Point-Slope

$$y - y_1 = m(x - x_1)$$

7 Area of a Triangle

$$A = \frac{1}{2}bh$$

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9 General Form of a Circle

$$Ax^2 + Ay^2 + Dx + Ey + F = 0$$

10 Standard Form of a Circle

$$(x - h)^2 + (y - k)^2 = r^2$$

- Center: `(h, k)`.
- If `h` or `k` are positive in **Standard Form** $\rightarrow$ They reflect a negative value, respectively.

11 Area of Square Inside Circle

$$A = 2r^2$$

12 Average Rate of Change of Function Over Interval

Average rate of change of $f(x)$ over interval $[a, b]$:

$$\frac{f(b) - f(a)}{b - a}$$

This represents the slope of the **Secant Line** that connects the points $(a, f(a))$ and $(b, f(b))$.