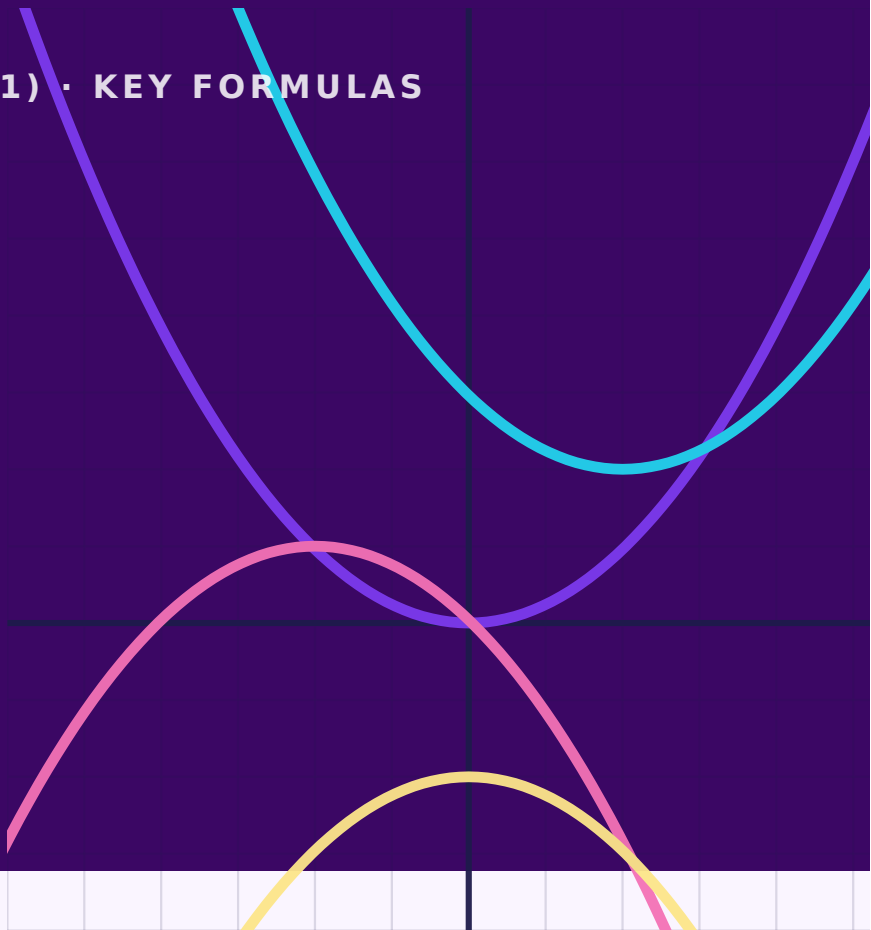


Algebra



Expanding

$$(a + b)^2 = a^2 + 2ab + b^2, \quad (a - b)^2 = a^2 - 2ab + b^2, \\ a^2 - b^2 = (a + b)(a - b)$$

Quadratic formula,

$$ax^2 + bx + c = 0 \quad \text{B}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Completing the square

$$x^2 + bx + c = \left(x + \frac{b}{2}\right)^2 - \frac{b^2}{4} + c$$

Turning point of

$$y = (x + p)^2 + q$$

$$(-p, q)$$

Arithmetic series, sum of n terms

B

$$S_n = \frac{n}{2} [2a + (n - 1)d]$$

Arithmetic n th term

$$u_n = a + (n - 1)d$$

Proportion

$$y \propto x^n \Rightarrow y = kx^n; \quad y \propto \frac{1}{x^n} \Rightarrow y = \frac{k}{x^n}$$

Functions

$$fg(x) = f(g(x)); \quad f^{-1}: \text{swap } x, y \text{ and rearrange}$$

B given in the exam. Learn the rest.