



Ταυτότητες

$$\blacksquare (\alpha + \beta)^2 = \alpha^2 + 2\alpha\beta + \beta^2$$

$$\blacksquare (\alpha - \beta)^2 = \alpha^2 - 2\alpha\beta + \beta^2$$

$$\blacksquare (\alpha + \beta)(\alpha - \beta) = \alpha^2 - \beta^2$$

$$\blacksquare (\alpha + \beta)^3 = \alpha^3 + 3\alpha^2\beta + 3\alpha\beta^2 + \beta^3$$

$$\blacksquare (\alpha - \beta)^3 = \alpha^3 - 3\alpha^2\beta + 3\alpha\beta^2 - \beta^3$$

$$\blacksquare \alpha^3 - \beta^3 = (\alpha - \beta)(\alpha^2 + \alpha\beta + \beta^2)$$

$$\blacksquare \alpha^3 + \beta^3 = (\alpha + \beta)(\alpha^2 - \alpha\beta + \beta^2)$$

$$\blacksquare (\chi + \alpha)(\chi + \beta) = \chi^2 + (\alpha + \beta)\chi + \alpha\beta$$

$$\blacksquare \alpha^v - \beta^v = (\alpha - \beta)(\alpha^{v-1} + \alpha^{v-2}\beta + \alpha^{v-3}\beta^2 + \dots + \alpha\beta^{v-2} + \beta^{v-1}), v \in \mathbb{N}^*$$

Ταυτότητες που προκύπτουν από τις παραπάνω:

$$\blacksquare (\alpha + \beta + \gamma)^2 = \alpha^2 + \beta^2 + \gamma^2 + 2\alpha\beta + 2\beta\gamma + 2\gamma\alpha$$

$$\blacksquare (\alpha + \beta + \gamma)^3 = \alpha^3 + \beta^3 + \gamma^3 + 3(\alpha + \beta)(\beta + \gamma)(\gamma + \alpha)$$

$$\blacksquare \alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta$$

$$\blacksquare \alpha^3 + \beta^3 = (\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta)$$

Ταυτότητα Euler

$$\alpha^3 + \beta^3 + \gamma^3 - 3\alpha\beta\gamma = \frac{1}{2}(\alpha + \beta + \gamma)[(\alpha - \beta)^2 + (\beta - \gamma)^2 + (\gamma - \alpha)^2]$$