

1.5 Αξιοσημείωτες ταυτότητες (μέρος 2ο)

Κυριακή, 4 Δεκεμβρίου 2022

11:51 πμ

Αν $x + \frac{1}{x} = 3$ να υπολογίσετε το

① $x^2 + \frac{1}{x^2} = ?$

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$\left(x + \frac{1}{x}\right)^2 = 3^2$$

$$x^2 + 2x \cdot \frac{1}{x} + \left(\frac{1}{x}\right)^2 = 3^2$$

$$x^2 + 2 + \frac{1}{x^2} = 9$$

$$x^2 + \frac{1}{x^2} = 9 - 2$$

$$x^2 + \frac{1}{x^2} = 7$$

$$\textcircled{2} \left(x - \frac{1}{x}\right)^2 = ;$$

$$\left(x - \frac{1}{x}\right)^2 = x^2 - 2x \cdot \frac{1}{x} + \left(\frac{1}{x}\right)^2 =$$

$$x^2 - 2 + \frac{1}{x^2} =$$

$$7 - 2 = 5$$

$$\textcircled{3} (x+1)^2 + \left(\frac{1}{x}+1\right)^2 =$$

$$x^2 + 2x + 1 + \frac{1}{x^2} + 2\frac{1}{x} + 1 =$$

$$x^2 + \frac{1}{x^2} + 2\left(x + \frac{1}{x}\right) + 2$$

$$x^2 + \frac{1}{x^2} + 2\left(x + \frac{1}{x}\right) + 2$$

$$7 + 2 \cdot 3 + 2 =$$

$$7 + 6 + 2 = 15$$

④ $x^3 + \frac{1}{x^3} = ;$

$$\left(x + \frac{1}{x}\right)^3 = 3^3$$

⋮