

Quadratic 3

Quadratic equation

$$\text{Solve } (x^2 - 5x + 5)^{x^2 - 11x + 30} = 1$$

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$$\text{Case 1 } 1^n = 1$$

$$x^2 - 5x + 5 = 1 \Rightarrow x^2 - 5x + 4 = 0 \Rightarrow x = 1, 4$$

$$\text{Case 2 } n^0 = 1, n \neq 0$$

$$x^2 - 11x + 30 = 0 \Rightarrow x = 5, 6$$

$$\text{When } x = 5, 6, x^2 - 11x + 30 \neq 0$$

$$\text{Case 3 } (-1)^{\text{even}} = 1$$

$$x^2 - 5x + 5 = -1 \Rightarrow x^2 - 5x + 6 = 0 \Rightarrow x = 2, 3$$

$$\text{When } x = 2, x^2 - 11x + 30 = 12(\text{even})$$

$$\text{When } x = 3, x^2 - 11x + 30 = 6(\text{even})$$

$$\text{Hence, } x = 1, 2, 3, 4, 5, 6$$