2次方程式 [2次方程式の解の公式]

<演習問題>
次の方程式を解け。

(1)　$x^2 - 3x + 1 = 0$

(2)　$x^2 - 5x + 2 = 0$

(3)　$x^2 - 7x + 4 = 0$

(4)　$2x^2 - 5x - 1 = 0$

(5)　$3x^2 - 7x - 1 = 0$

(6)　$2x^2 - 4x + 1 = 0$

(7)　$3x^2 - 6x + 2 = 0$

(8)　$x^2 - 2x - 6 = 0$

(9)　$x^2 - 4x - 6 = 0$

(10)　$x^2 + 6x + 4 = 0$

(11)　$x^2 + 10x + 18 = 0$

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次の方程式を解け。

(1) $x^2 - 3x + 1 = 0$

$x^2 - 3x + 1 = 0$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4 \times 1 \times 1}}{2 \times 1}$$

$$x = \frac{3 \pm \sqrt{5}}{2}$$

(2) $x^2 - 5x + 2 = 0$

$x^2 - 5x + 2 = 0$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \times 1 \times 2}}{2 \times 1}$$

$$x = \frac{5 \pm \sqrt{17}}{2}$$

(3) $x^2 - 7x + 4 = 0$

$x^2 - 7x + 4 = 0$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4 \times 1 \times 4}}{2 \times 1}$$

$$x = \frac{7 \pm \sqrt{33}}{2}$$

(4) $2x^2 - 5x - 1 = 0$

$2x^2 - 5x - 1 = 0$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \times 2 \times (-1)}}{2 \times 2}$$

$$x = \frac{5 \pm \sqrt{33}}{4}$$

(5) $3x^2 - 7x - 1 = 0$

$3x^2 - 7x - 1 = 0$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4 \times 3 \times (-1)}}{2 \times 3}$$

$$x = \frac{7 \pm \sqrt{61}}{6}$$

(6) $2x^2 - 4x + 1 = 0$

$2x^2 - 4x + 1 = 0$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \times 2 \times 1}}{2 \times 2}$$

$$x = \frac{4 \pm \sqrt{8}}{4}$$

$$x = \frac{2 \pm \sqrt{2}}{2}$$

(7) $3x^2 - 6x + 2 = 0$

$3x^2 - 6x + 2 = 0$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4 \times 3 \times 2}}{2 \times 3}$$

$$x = \frac{6 \pm \sqrt{12}}{6}$$

$$x = \frac{3 \pm \sqrt{3}}{3}$$

(8) $x^2 - 2x - 6 = 0$

$x^2 - 2x - 6 = 0$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \times 1 \times (-6)}}{2 \times 1}$$

$$x = \frac{2 \pm \sqrt{28}}{2}$$

$$x = 1 \pm \sqrt{7}$$

(9) $x^2 - 4x - 6 = 0$

$x^2 - 4x - 6 = 0$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \times 1 \times (-6)}}{2 \times 1}$$

$$x = \frac{4 \pm \sqrt{40}}{2}$$

$$x = 2 \pm \sqrt{10}$$

(10) $x^2 + 6x + 4 = 0$

$x^2 + 6x + 4 = 0$

$$x = \frac{-6 \pm \sqrt{6^2 - 4 \times 1 \times 4}}{2 \times 1}$$

$$x = \frac{-6 \pm \sqrt{20}}{2}$$

$$x = -3 \pm \sqrt{5}$$

(11) $x^2 + 10x + 18 = 0$

$x^2 + 10x + 18 = 0$

$$x = \frac{-10 \pm \sqrt{10^2 - 4 \times 1 \times 18}}{2 \times 1}$$

$$x = \frac{-10 \pm \sqrt{28}}{2}$$

$$x = -5 \pm \sqrt{7}$$