

問題番号
09M0301_3
レベル
☆☆☆

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中3 第3章 2次方程式
①平方根を利用した解き方 No.3 解答

授業動画QR



1. 次の方程式を解きなさい。

(1) $x^2 - 16 = 0$

$$\begin{aligned} x &= \pm\sqrt{16} \\ &= \pm\sqrt{4^2} \\ &= \pm 4 \end{aligned}$$

(2) $x^2 - 18 = 0$

$$\begin{aligned} x^2 &= 18 \\ x &= \pm\sqrt{18} = \pm\sqrt{3^2 \times 2} \\ x &= \pm 3\sqrt{2} \end{aligned}$$

(3) $4x^2 - 36 = 0$

$$\begin{aligned} \frac{1}{4}(4x^2 - 36) &= \frac{1}{4} \times 0 \\ x^2 - 9 &= 0 \\ x^2 &= 9 \\ x &= \pm\sqrt{9} = \pm 3 \end{aligned}$$

(4) $3x^2 - 12 = 0$

$$\begin{aligned} \frac{1}{3}(3x^2 - 12) &= \frac{1}{3} \times 0 \\ x^2 - 4 &= 0 \\ x^2 &= 4 \\ x &= \pm\sqrt{2^2} = \pm 2 \end{aligned}$$

(5) $\frac{1}{5}x^2 - 5 = 0$

$$\begin{aligned} 5 \times \left(\frac{1}{5}x^2 - 5\right) &= 5 \times 0 \\ x^2 - 25 &= 0 \\ x^2 &= 25 \\ x &= \pm\sqrt{5^2} = \pm 5 \end{aligned}$$

(6) $-x^2 + 20 = 0$

$$\begin{aligned} (-1) \times (-x^2 + 20) &= (-1) \times 0 \\ x^2 - 20 &= 0 \\ x^2 &= 20 \\ x &= \pm\sqrt{20} = \pm\sqrt{2^2 \times 5} \\ x &= \pm 2\sqrt{5} \end{aligned}$$

(1) $x = \pm 4$	(2) ± 5	(3) ± 3
(4) ± 2	(5) $x = \pm 3\sqrt{2}$	(6) $x = \pm 2\sqrt{5}$

2. 次の方程式を解きなさい。

(1) $(x + 3)^2 = 16$

$$\begin{aligned} x + 3 &= \pm\sqrt{16} \\ &= \pm\sqrt{4^2} \\ x &= \pm 4 - 3 \end{aligned}$$

(2) $\left(x - \frac{3}{4}\right)^2 = \frac{16}{9}$

$$\begin{aligned} x - \frac{3}{4} &= \pm\sqrt{\frac{16}{9}} = \pm\sqrt{\frac{4^2}{3^2}} = \pm\frac{4}{3} \\ x &= \pm\frac{4}{3} + \frac{3}{4} \end{aligned}$$

(3) $(x + 1)^2 - 12 = 0$

$$\begin{aligned} (x + 1)^2 &= 12 \\ (x + 1) &= \pm\sqrt{12} = \pm\sqrt{2^2 \times 3} \\ x + 1 &= \pm 2\sqrt{3} \\ x &= -1 \pm 2\sqrt{3} \end{aligned}$$

(4) $(x - 7)^2 = 49$

$$\begin{aligned} (x - 7) &= \pm\sqrt{49} = \pm\sqrt{7^2} \\ &= \pm 7 \\ x &= 7 \pm 7 \end{aligned}$$

(5) $(x - \sqrt{3})^2 - 12 = 0$

$$\begin{aligned} (x - \sqrt{3})^2 &= 12 \\ (x - \sqrt{3}) &= \pm\sqrt{12} = \pm\sqrt{2^2 \times 3} \\ (x - \sqrt{3}) &= \pm 2\sqrt{3} \\ x &= \sqrt{3} \pm 2\sqrt{3} \end{aligned}$$

(6) $(x + 2\sqrt{2})^2 = 50$

$$\begin{aligned} (x + 2\sqrt{2}) &= \pm\sqrt{50} = \pm\sqrt{5^2 \times 2} \\ (x + 2\sqrt{2}) &= \pm 5\sqrt{2} \\ x &= -2\sqrt{2} \pm 5\sqrt{2} \end{aligned}$$

(1) $x = -7, x = 1$	(2) $x = \frac{25}{12}, x = -\frac{7}{12}$	(3) $x = -1 \pm 2\sqrt{3}$
(4) $x = 0, x = 14$	(5) $x = -\sqrt{3}, x = 3\sqrt{3}$	(6) $x = -7\sqrt{2}, x = 3\sqrt{2}$