

平方根のいろいろな計算(2)

【1】次の計算をなさい。

$$\begin{aligned}
 (1) \sqrt{3}(\sqrt{6} + \sqrt{2}) &= \sqrt{3} \times \sqrt{6} + \sqrt{3} \times \sqrt{2} \\
 &= \sqrt{3} \times \sqrt{3} \times \sqrt{2} + \sqrt{6} \\
 &= 3\sqrt{2} + \sqrt{6}
 \end{aligned}$$

$$\begin{aligned}
 (2) \sqrt{2}(4 - \sqrt{5}) &= \sqrt{2} \times 4 - \sqrt{2} \times \sqrt{5} \\
 &= 4\sqrt{2} - \sqrt{10}
 \end{aligned}$$

$$\begin{aligned}
 (3) 4\sqrt{2} - 4\sqrt{6} \times \sqrt{12} &= 4\sqrt{2} - 4\sqrt{72} \\
 &= 4\sqrt{2} - 4 \times 6\sqrt{2} \\
 &= 4\sqrt{2} - 24\sqrt{2} \\
 &= -20\sqrt{2}
 \end{aligned}$$

$$\begin{aligned}
 (4) \sqrt{14} \times \sqrt{21} - \frac{3}{\sqrt{3}} \\
 &= \sqrt{2} \times \sqrt{7} \times \sqrt{3} \times \sqrt{7} - \frac{3\sqrt{3}}{3} \\
 &= 7\sqrt{6} - \sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 (5) (\sqrt{5} - 2)(\sqrt{5} - 3) \\
 &= (\sqrt{5})^2 + (-2 - 3)\sqrt{5} + (-2) \times (-3) \\
 &= 5 - 5\sqrt{5} + 6 \\
 &= 11 - 5\sqrt{5}
 \end{aligned}$$

$$\begin{aligned}
 (6) (\sqrt{3} + 2)^2 \\
 &= (\sqrt{3})^2 + 2 \times 2 \times \sqrt{3} + 2^2 \\
 &= 3 + 4\sqrt{3} + 4 \\
 &= 7 + 4\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 (7) (3\sqrt{2} - \sqrt{3})^2 \\
 &= (3\sqrt{2})^2 - 2 \times \sqrt{3} \times 3\sqrt{2} + (\sqrt{3})^2 \\
 &= 18 - 6\sqrt{6} + 3 \\
 &= 21 - 6\sqrt{6}
 \end{aligned}$$

$$\begin{aligned}
 (8) (\sqrt{3} + 4)(\sqrt{3} - 4) \\
 &= (\sqrt{3})^2 - 4^2 \\
 &= -13
 \end{aligned}$$

【2】 $x = 2 + \sqrt{7}$ のとき、次の計算をなさい。

$$\begin{aligned}
 (1) x^2 - 7 \\
 &= (x + \sqrt{7})(x - \sqrt{7}) \\
 &= \{(2 + \sqrt{7}) + \sqrt{7}\} \{(2 + \sqrt{7}) - \sqrt{7}\} \\
 &= 2(2 + 2\sqrt{7}) \\
 &= 4 + 4\sqrt{7}
 \end{aligned}$$

$$\begin{aligned}
 (2) x^2 - x - 2 &= (x + 1)(x - 2) \\
 &= (2 + \sqrt{7} + 1)(2 + \sqrt{7} - 2) \\
 &= (3 + \sqrt{7}) \times \sqrt{7} \\
 &= 7 + 3\sqrt{7}
 \end{aligned}$$

