

問題 1.6. 次の式を絶対値記号を用いないで表しなさい.

$$(1) |-5| = 5$$

$$(2) |13| = 13$$

$$(3) |\pi - 3| = \pi - 3$$

$$(4) |\sqrt{2} - 2| = -(\sqrt{2} - 2) = 2 - \sqrt{2}$$

$$(5) |\sqrt{2} - 1| + |\sqrt{2} - 4| = (\sqrt{2} - 1) - (\sqrt{2} - 4) = 3$$

問題 1.7. 次の式を計算して簡単にせよ.

$$(1) 2\sqrt{5} \times 3\sqrt{20} = (2 \times 3)\sqrt{5 \times 20} = 6\sqrt{5^2 \times 2^2} = 6 \times 5 \times 2 = 60$$

$$(2) 3\sqrt{27} + 2\sqrt{12} - \sqrt{75}$$

$$= 3\sqrt{3^2 \times 3} + 2\sqrt{2^2 \times 3} - \sqrt{5^2 \times 3} = 9\sqrt{3} + 4\sqrt{3} - 5\sqrt{3} = (9 + 4 - 5)\sqrt{3} = 8\sqrt{3}$$

$$(3) \sqrt{5}(\sqrt{40} - 4\sqrt{5}) = \sqrt{5}(2\sqrt{10} - 4\sqrt{5}) = 2\sqrt{50} - 4 \times 5 = 10\sqrt{2} - 20$$

$$(4) (2\sqrt{3} - 5)(\sqrt{3} + 3) = 2 \times 3 + 6\sqrt{3} - 5\sqrt{3} - 15 = \sqrt{3} - 9$$

$$(5) (\sqrt{5} - 3)(\sqrt{5} + 3) = (\sqrt{5})^2 - 3^2 = 5 - 9 = -4$$

$$(6) (\sqrt{5} + \sqrt{2})^2 = 5 + 2(\sqrt{5} \times \sqrt{2}) + 2 = 7 + 2\sqrt{10}$$

$$(7) \frac{\sqrt{50}}{\sqrt{8}} = \frac{\sqrt{50} \times \sqrt{8}}{\sqrt{8} \times \sqrt{8}} = \frac{\sqrt{5^2 \times 2} \times \sqrt{2^2 \times 2}}{8} = \frac{5 \times 2 \times 2}{8} = \frac{5}{2}$$

または

$$\frac{\sqrt{50}}{\sqrt{8}} = \sqrt{\frac{50}{8}} = \sqrt{\frac{25}{4}} = \sqrt{\frac{5^2}{2^2}} = \frac{5}{2}$$

問題 1.8. 次の式の分母を有理化しなさい.

$$(1) \frac{14}{3\sqrt{7}} = \frac{2\sqrt{7}}{3}$$

$$(2) \frac{1}{\sqrt{3} + 1} = \frac{\sqrt{3} - 1}{2}$$

$$(3) \frac{1 + \sqrt{2}}{1 - \sqrt{2}} = -3 - 2\sqrt{2}$$