

## 反射テスト 平方根 入試問題 計算 01

1. 次の計算をせよ. ただし分母は有理化し, 根内は簡単にすること. (S級1分, A級2分, B級3分25秒, C級5分)

$$(1) \quad \frac{3}{\sqrt{18}} + \frac{\sqrt{6}}{\sqrt{3}} - \sqrt{32}$$

$$(2) \quad \frac{\sqrt{8} + \sqrt{6}}{\sqrt{2}} - \frac{1 - \sqrt{12}}{\sqrt{3}}$$

$$(3) \quad (2\sqrt{3} - \sqrt{8})^2 - (\sqrt{6} + 2\sqrt{2})(\sqrt{6} - 2\sqrt{2})$$

2. 次の計算をせよ. ただし分母は有理化し, 根内は簡単にすること. (S級1分, A級2分, B級3分25秒, C級5分)

$$(1) \quad \frac{2}{\sqrt{12}} - \frac{\sqrt{6}}{\sqrt{2}} - \sqrt{27}$$

$$(2) \quad \frac{\sqrt{15} - \sqrt{27}}{\sqrt{3}} - \frac{1 - \sqrt{20}}{\sqrt{5}}$$

$$(3) \quad (2\sqrt{5} - \sqrt{18})^2 - (\sqrt{10} + 3\sqrt{5})(\sqrt{10} - 3\sqrt{5})$$

## 反射テスト 平方根 入試問題 計算 01 解答解説

1. 次の計算をせよ. ただし分母は有理化し, 根内は簡単にすること. (S級1分, A級2分, B級3分25秒, C級5分)

$$\begin{aligned}(1) \quad & \frac{3}{\sqrt{18}} + \frac{\sqrt{6}}{\sqrt{3}} - \sqrt{32} \\ &= \frac{3}{3\sqrt{2}} + \sqrt{2} - 4\sqrt{2} \\ &= \frac{1 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} - 3\sqrt{2} \\ &= \frac{\sqrt{2} - 6\sqrt{2}}{2} = -\frac{5\sqrt{2}}{2}\end{aligned}$$

$$\begin{aligned}(2) \quad & \frac{\sqrt{8} + \sqrt{6}}{\sqrt{2}} - \frac{1 - \sqrt{12}}{\sqrt{3}} \\ &= \frac{\sqrt{8} \times \sqrt{2} + \sqrt{6} \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} - \frac{1 \times \sqrt{3} - \sqrt{12} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} \\ &= \frac{\sqrt{16} + \sqrt{12}}{2} - \frac{\sqrt{3} - \sqrt{36}}{3} \\ &= \frac{3(4 + 2\sqrt{3}) - 2(\sqrt{3} - 6)}{6} \\ &= \frac{12 + 6\sqrt{3} - 2\sqrt{3} + 12}{6} \\ &= \frac{24 + 4\sqrt{3}}{6} = \frac{12 + 2\sqrt{3}}{3}\end{aligned}$$

☆  $\sqrt{\quad}$ 内の約分ができるともっと早い.

$$\text{与式} = \frac{\sqrt{8}}{\sqrt{2}} + \frac{\sqrt{6}}{\sqrt{2}} - \frac{1}{\sqrt{3}} + \frac{\sqrt{12}}{\sqrt{3}} = \sqrt{4} + \sqrt{3} - \frac{\sqrt{3}}{3} + \sqrt{4} = 2 + 2 + \frac{3\sqrt{3} - \sqrt{3}}{3} = 4 + \frac{2\sqrt{3}}{3}$$

$$\begin{aligned}(3) \quad & (2\sqrt{3} - \sqrt{8})^2 - (\sqrt{6} + 2\sqrt{2})(\sqrt{6} - 2\sqrt{2}) \\ &= (2\sqrt{3} - 2\sqrt{2})^2 - \{(\sqrt{6})^2 - (2\sqrt{2})^2\} \\ &= (2\sqrt{3})^2 - 8\sqrt{6} + (2\sqrt{2})^2 - (6 - 8) \\ &= 12 - 8\sqrt{6} + 8 - (-2) \\ &= 20 - 8\sqrt{6} + 2 \\ &= 22 - 8\sqrt{6}\end{aligned}$$

2. 次の計算をせよ. ただし分母は有理化し, 根内は簡単にすること. (S級1分, A級2分, B級3分25秒, C級5分)

$$(1) \quad \frac{2}{\sqrt{12}} - \frac{\sqrt{6}}{\sqrt{2}} - \sqrt{27}$$

$$= \frac{2}{2\sqrt{3}} - \sqrt{3} - 3\sqrt{3}$$

$$= \frac{1 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} - 4\sqrt{3}$$

$$= \frac{\sqrt{3} - 12\sqrt{3}}{3} = -\frac{11\sqrt{3}}{3}$$

$$(2) \quad \frac{\sqrt{15} - \sqrt{27}}{\sqrt{3}} - \frac{1 - \sqrt{20}}{\sqrt{5}}$$

$$= \frac{\sqrt{15} \times \sqrt{3} - \sqrt{27} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} - \frac{1 \times \sqrt{5} - \sqrt{20} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}}$$

$$= \frac{\sqrt{45} - \sqrt{81}}{3} - \frac{\sqrt{5} - \sqrt{100}}{5}$$

$$= \frac{5(3\sqrt{5} - 9) - 3(\sqrt{5} - 10)}{15}$$

$$= \frac{15\sqrt{5} - 45 - 3\sqrt{5} + 30}{15}$$

$$= \frac{-15 + 12\sqrt{5}}{15} = \frac{4\sqrt{5} - 5}{5}$$

$$(3) \quad (2\sqrt{5} - \sqrt{18})^2 - (\sqrt{10} + 3\sqrt{5})(\sqrt{10} - 3\sqrt{5})$$

$$= (2\sqrt{5} - 3\sqrt{2})^2 - \{(\sqrt{10})^2 - (3\sqrt{5})^2\}$$

$$= (2\sqrt{5})^2 - 12\sqrt{10} + (3\sqrt{2})^2 - (10 - 45)$$

$$= 20 - 12\sqrt{10} + 18 - (-35)$$

$$= 38 - 12\sqrt{10} + 35$$

$$= 73 - 12\sqrt{10}$$