

1. $\sqrt{175} = a\sqrt{7}$, $\sqrt{1200} = b\sqrt{3}$ 일 때, ab 의 값으로 알맞은 것을 고르면?

① 80

② 100

③ 120

④ 140

⑤ 160

해설

$$\sqrt{175} = \sqrt{5^2 \times 7} = 5\sqrt{7}$$

$$\sqrt{1200} = \sqrt{2^2 \times 3 \times 10^2} = 20\sqrt{3}$$

$$a = 5, b = 20$$

$$\therefore ab = 5 \times 20 = 100$$

2. 다음 중 $\sqrt{18} + 2\sqrt{2} - \frac{2}{\sqrt{2}}$ 을 바르게 계산한 것은?

① $\sqrt{2}$

② $2\sqrt{2}$

③ $3\sqrt{2}$

④ $4\sqrt{2}$

⑤ $5\sqrt{2}$

해설

$$\begin{aligned}(\text{준식}) &= 3\sqrt{2} + 2\sqrt{2} - \frac{2 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} \\ &= 5\sqrt{2} - \sqrt{2} \\ &= 4\sqrt{2}\end{aligned}$$

3. $\sqrt{2}(2\sqrt{3}-6) - \frac{2-4\sqrt{3}}{\sqrt{2}} = a\sqrt{2} + b\sqrt{6}$ 일 때, ab 의 값을 구하여라.

▶ 답 :

▷ 정답 : -28

해설

$$\begin{aligned}
 & \sqrt{2}(2\sqrt{3}-6) - \frac{2-4\sqrt{3}}{\sqrt{2}} \\
 &= 2\sqrt{6}-6\sqrt{2} - \frac{\sqrt{2}(2-4\sqrt{3})}{\sqrt{2}\sqrt{2}} \\
 &= 2\sqrt{6}-6\sqrt{2} - \frac{2\sqrt{2}-4\sqrt{6}}{2} \\
 &= 2\sqrt{6}-6\sqrt{2} - (\sqrt{2}-2\sqrt{6}) \\
 &= 2\sqrt{6}-6\sqrt{2} - \sqrt{2} + 2\sqrt{6} \\
 &= -7\sqrt{2} + 4\sqrt{6} \\
 &a = -7, \quad b = 4 \\
 &\therefore ab = -28
 \end{aligned}$$

4. $\frac{\sqrt{5}}{2\sqrt{5}-3}$ 의 분모를 유리화하면?

① $\frac{13\sqrt{5}}{11}$

④ $\frac{10-3\sqrt{5}}{11}$

② $\frac{10+3\sqrt{5}}{11}$
⑤ $\frac{11}{10-3\sqrt{5}}$

③ $\frac{10+3\sqrt{5}}{29}$

해설

$$\begin{aligned}\frac{\sqrt{5}(2\sqrt{5}+3)}{(2\sqrt{5}-3)(2\sqrt{5}+3)} &= \frac{10+3\sqrt{5}}{(2\sqrt{5})^2-3^2} \\ &= \frac{10+3\sqrt{5}}{20-9} \\ &= \frac{10+3\sqrt{5}}{11}\end{aligned}$$

5. $5\sqrt{18} \times \frac{\sqrt{2}}{3}$ 를 간단히 하면?

① $15\sqrt{2}$

② 15

③ $10\sqrt{3}$

④ $10\sqrt{2}$

⑤ 10

해설

$$5\sqrt{18} \times \frac{\sqrt{2}}{3} = 5 \times \frac{\sqrt{18 \times 2}}{3} = 5 \times \frac{\sqrt{36}}{3} = 10$$

6. $\frac{4\sqrt{a}}{\sqrt{2}}$ 의 분모를 유리화 하였더니 $2\sqrt{6}$ 이 되었다. 이 때, a 의 값을 구하여라.

▶ 답 :

▷ 정답 : $a = 3$

해설

$$\frac{4\sqrt{a}}{\sqrt{2}} = \frac{4\sqrt{a}\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{4\sqrt{2a}}{2} = 2\sqrt{2a} = 2\sqrt{6}$$

따라서 $2a = 6$ 이므로 $a = 3$ 이다.

7. $\frac{3}{\sqrt{2}} \div 2\sqrt{3} \times \sqrt{\frac{5}{2}}$ 를 간단히 하면?

① $\sqrt{2}$

② $\frac{\sqrt{5}}{2}$

③ $\sqrt{5}$

④ $\frac{\sqrt{15}}{4}$

⑤ $\sqrt{15}$

해설

$$\begin{aligned}\frac{3}{\sqrt{2}} \div 2\sqrt{3} \times \sqrt{\frac{5}{2}} &= \frac{3}{\sqrt{2}} \times \frac{1}{2\sqrt{3}} \times \frac{\sqrt{5}}{\sqrt{2}} \\ &= \frac{3\sqrt{5}}{4\sqrt{3}} = \frac{3\sqrt{5} \times \sqrt{3}}{4\sqrt{3} \times \sqrt{3}} \\ &= \frac{\sqrt{15}}{4}\end{aligned}$$

8. $\frac{\sqrt{32}}{\sqrt{2}} - 3 = A$, $\frac{12}{\sqrt{3}} - \sqrt{12} = B$ 일 때, $A + \sqrt{2}B$ 의 값을 구하여라.

▶ 답 :

▷ 정답 : $1 + 2\sqrt{6}$

해설

$$A = \frac{\sqrt{32} \times \sqrt{2}}{2} - 3 = 4 - 3 = 1$$

$$\sqrt{2}B = \sqrt{2} \left(\frac{12}{\sqrt{3}} - 2\sqrt{3} \right) = \frac{12\sqrt{6}}{3} - 2\sqrt{6} = 2\sqrt{6}$$

$$\therefore A + \sqrt{2}B = 1 + 2\sqrt{6}$$

9. $\sqrt{192} - \sqrt{54} - \sqrt{108} + \sqrt{24}$ 를 $a\sqrt{3} + b\sqrt{6}$ 의 꼴로 고칠 때, $a - b$ 의 값을 구하면?

① 1

② 2

③ 3

④ 4

⑤ 5

해설

$$\begin{aligned}\sqrt{192} - \sqrt{54} - \sqrt{108} + \sqrt{24} \\&= 8\sqrt{3} - 3\sqrt{6} - 6\sqrt{3} + 2\sqrt{6} \\&= 2\sqrt{3} - \sqrt{6}\end{aligned}$$

$$\therefore a = 2, b = -1$$

$$\therefore a - b = 2 - (-1) = 3$$

10. 다음 식의 계산 결과가 틀린 것은?

① $\sqrt{24} + 5\sqrt{6} = 7\sqrt{6}$

② $\sqrt{12} + \sqrt{27} - \sqrt{48} = \sqrt{3}$

③ $\frac{\sqrt{5}}{3} - \frac{\sqrt{45}}{2} + \frac{\sqrt{5}}{6} = -\frac{\sqrt{5}}{6}$

④ $\sqrt{12} + \sqrt{50} - \sqrt{3} + 2\sqrt{2} = \sqrt{3} + 7\sqrt{2}$

⑤ $5\sqrt{3} + \frac{15}{\sqrt{3}} - 2\sqrt{75} = 0$

해설

① $\sqrt{24} + 5\sqrt{6} = 2\sqrt{6} + 5\sqrt{6} = 7\sqrt{6}$

② $\sqrt{12} + \sqrt{27} - \sqrt{48} = 2\sqrt{3} + 3\sqrt{3} - 4\sqrt{3} = \sqrt{3}$

③ $\frac{\sqrt{5}}{3} - \frac{\sqrt{45}}{2} + \frac{\sqrt{5}}{6}$
 $= \frac{2\sqrt{5}}{6} - \frac{9\sqrt{5}}{6} + \frac{\sqrt{5}}{6}$
 $= -\frac{6\sqrt{5}}{6} = -\sqrt{5}$

④ $\sqrt{12} + \sqrt{50} - \sqrt{3} + 2\sqrt{2}$
 $= 2\sqrt{3} + 5\sqrt{2} - \sqrt{3} + 2\sqrt{2}$
 $= \sqrt{3} + 7\sqrt{2}$

⑤ $5\sqrt{3} + \frac{15}{\sqrt{3}} - 2\sqrt{75}$
 $= 5\sqrt{3} + \frac{15\sqrt{3}}{3} - 10\sqrt{3}$
 $= 5\sqrt{3} + 5\sqrt{3} - 10\sqrt{3} = 0$