

1. $2\sqrt{50} - \sqrt{98} + \sqrt{18}$ 을 계산하면?

① $-3\sqrt{2}$

② $4\sqrt{2}$

③ $5\sqrt{2}$

④ $6\sqrt{2}$

⑤ $-7\sqrt{2}$

해설

$$\begin{aligned}(\text{준식}) &= 2\sqrt{5 \times 5 \times 2} - \sqrt{7 \times 7 \times 2} + \sqrt{3 \times 3 \times 2} \\ &= 10\sqrt{2} - 7\sqrt{2} + 3\sqrt{2} \\ &= 6\sqrt{2}\end{aligned}$$

2. $3\sqrt{8}-4\sqrt{18}+\sqrt{50}$ 을 바르게 계산한 것을 고르면?

- ① $\sqrt{3}$ ② $\sqrt{2}$ ③ 0 ④ $-\sqrt{3}$ ⑤ $-\sqrt{2}$

해설

$$(\text{준식}) = 6\sqrt{2} - 12\sqrt{2} + 5\sqrt{2} = -\sqrt{2}$$

3. $6\sqrt{6} - 4\sqrt{3} + 2\sqrt{6} - 3\sqrt{3}$ 을 간단히 하면?

① $2\sqrt{6} + 1\sqrt{3}$

② $3\sqrt{6} - 2\sqrt{3}$

③ $7\sqrt{6} + 8\sqrt{3}$

④ $8\sqrt{6} - 7\sqrt{3}$

⑤ $4\sqrt{6} + 2\sqrt{3}$

해설

$$\begin{aligned} & 6\sqrt{6} - 4\sqrt{3} - 3\sqrt{3} + 2\sqrt{6} \\ &= (6\sqrt{6} + 2\sqrt{6}) - (4\sqrt{3} + 3\sqrt{3}) \\ &= 8\sqrt{6} - 7\sqrt{3} \end{aligned}$$

4. $4\sqrt{5} + 6\sqrt{2} + 3\sqrt{5} - 4\sqrt{2}$ 를 간단히 하면?

① $\sqrt{5} - 2\sqrt{2}$

② $\sqrt{5} + 4\sqrt{2}$

③ $2\sqrt{5} + 5\sqrt{2}$

④ $7\sqrt{5} - 2\sqrt{2}$

⑤ $7\sqrt{5} + 2\sqrt{2}$

해설

$$\begin{aligned} & 4\sqrt{5} + 6\sqrt{2} + 3\sqrt{5} - 4\sqrt{2} \\ &= (4+3)\sqrt{5} + (6-4)\sqrt{2} \\ &= 7\sqrt{5} + 2\sqrt{2} \end{aligned}$$

5. 다음 중 계산이 틀린 것은?

① $\sqrt{5} - \sqrt{7} - 3\sqrt{5} + 2\sqrt{7} = -2\sqrt{5} + \sqrt{7}$

② $\frac{5 + \sqrt{15}}{10} + \frac{\sqrt{15} - 3}{6} = \frac{4\sqrt{15}}{15}$

③ $4\sqrt{2} - \sqrt{3} + 4\sqrt{3} - 3\sqrt{2} = \sqrt{2} + 3\sqrt{3}$

④ $7\sqrt{7} + \frac{3}{4}\sqrt{5} - \frac{1}{2}\sqrt{7} + \sqrt{5} = \frac{13\sqrt{7}}{2} + 8\sqrt{5}$

⑤ $7\sqrt{2} + \frac{3}{2} - \frac{\sqrt{2}}{2} - \frac{7}{2} = \frac{13\sqrt{2}}{2} - 2$

해설

④ $7\sqrt{7} + \frac{3}{4}\sqrt{5} - \frac{1}{2}\sqrt{7} + \sqrt{5} = \frac{13\sqrt{7}}{2} + \frac{7\sqrt{5}}{4}$

6. $\frac{6\sqrt{2}}{2} + \frac{3\sqrt{5}}{5} - \frac{3\sqrt{5}}{5} + 2$ 를 간단히 나타내면?

① $3\sqrt{2} + 2$

② $3\sqrt{2} + 3\sqrt{5} + 2$

③ $3\sqrt{5} + 2$

④ $3\sqrt{2} - 2$

⑤ $3\sqrt{5} - 2$

해설

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

7. $\sqrt{48} - 4\sqrt{32} + 3\sqrt{12} + \sqrt{50}$ 을 $a\sqrt{3} + b\sqrt{2}$ 의 꼴로 고칠 때, $a + b$ 의 값은?

① -21

② -1

③ 4

④ 9

⑤ 21

해설

$$\begin{aligned} & \sqrt{48} - 4\sqrt{32} + 3\sqrt{12} + \sqrt{50} \\ &= 4\sqrt{3} - 16\sqrt{2} + 6\sqrt{3} + 5\sqrt{2} \\ &= 10\sqrt{3} - 11\sqrt{2} \text{에서} \\ & a = 10, b = -11 \\ & \therefore a + b = -1 \end{aligned}$$

8. 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

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

9. 다음 중 계산이 틀린 것은?

① $\sqrt{20} + 3\sqrt{45} = 11\sqrt{5}$

② $\sqrt{12} + \sqrt{27} = 5\sqrt{3}$

③ $\sqrt{7} - \sqrt{28} = -\sqrt{7}$

④ $\sqrt{6} + \sqrt{24} = 3\sqrt{6}$

⑤ $\frac{\sqrt{3}}{10} - \frac{2\sqrt{3}}{5} = -\frac{\sqrt{3}}{10}$

해설

⑤ $\frac{\sqrt{3}}{10} - \frac{2\sqrt{3}}{5} = \frac{\sqrt{3}}{10} - \frac{4\sqrt{3}}{10} = -\frac{3\sqrt{3}}{10}$

10. 다음 중 $3\sqrt{5}-\sqrt{20}+\sqrt{32}-2\sqrt{18}$ 을 간단히 하였을 때, 올바른 것은?

- ① $\sqrt{5}-2\sqrt{2}$ ② $2\sqrt{5}+\sqrt{2}$ ③ $\sqrt{5}+\sqrt{2}$
④ $2\sqrt{5}-\sqrt{2}$ ⑤ $2\sqrt{5}-3\sqrt{2}$

해설

$$3\sqrt{5}-2\sqrt{5}+4\sqrt{2}-6\sqrt{2}=\sqrt{5}-2\sqrt{2}$$

11. 다음 식을 간단히 하면?

$$\frac{3}{\sqrt{2}} + \frac{5}{\sqrt{2}} - \sqrt{2}(2 + \sqrt{6})$$

- ① $\sqrt{2} - 2\sqrt{3}$ ② $\sqrt{2} - \sqrt{3}$ ③ $\sqrt{2} - 2$
④ $2\sqrt{2} - \sqrt{3}$ ⑤ $2\sqrt{2} - 2\sqrt{3}$

해설

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

12. $\sqrt{108} - \sqrt{48} - \sqrt{27} + \sqrt{24}$ 를 $a\sqrt{3} + b\sqrt{6}$ 의 꼴로 고칠 때, $a - b$ 의 값은?

- ① -3 ② -1 ③ 0 ④ 1 ⑤ 3

해설

$$\begin{aligned} & \sqrt{108} - \sqrt{48} - \sqrt{27} + \sqrt{24} \\ &= 6\sqrt{3} - 4\sqrt{3} - 3\sqrt{3} + 2\sqrt{6} \\ &= -\sqrt{3} + 2\sqrt{6} \\ \therefore a - b &= -1 - 2 = -3 \end{aligned}$$

13. 다음 보기 중에서 옳은 것을 모두 고르면?

보기

㉠ $\frac{\sqrt{6}}{3} + \frac{\sqrt{6}}{2} - 2\sqrt{6} = -\frac{7\sqrt{6}}{6}$
㉡ $\frac{3\sqrt{2}}{2} + \frac{5\sqrt{2}}{2} - 2\sqrt{2} - 2\sqrt{3} = 2\sqrt{2} - \sqrt{3}$
㉢ $\frac{3\sqrt{2}}{4} - 3\sqrt{2} + \sqrt{32} = \frac{7\sqrt{2}}{4}$
㉤ $\sqrt{192} - \sqrt{54} - \sqrt{108} + \sqrt{24} = 2\sqrt{3} - \sqrt{6}$

① ㉠, ㉡

② ㉠, ㉡, ㉢

③ ㉠, ㉢

④ ㉠, ㉢, ㉤

⑤ ㉠, ㉡, ㉢, ㉤

해설

㉠ $\frac{\sqrt{6}}{3} + \frac{\sqrt{6}}{2} - 2\sqrt{6} = \frac{5\sqrt{6}}{6} - 2\sqrt{6} = -\frac{7\sqrt{6}}{6}$
㉡ $\frac{3\sqrt{2}}{2} + \frac{5\sqrt{2}}{2} - 2\sqrt{2} - 2\sqrt{3}$
 $= 4\sqrt{2} - 2\sqrt{2} - 2\sqrt{3}$
 $= 2\sqrt{2} - 2\sqrt{3}$
㉢ $\frac{3\sqrt{2}}{4} - 3\sqrt{2} + \sqrt{32} = \frac{3\sqrt{2}}{4} + \sqrt{2} = \frac{7\sqrt{2}}{4}$
㉤ $\sqrt{192} - \sqrt{54} - \sqrt{108} + \sqrt{24}$
 $= 8\sqrt{3} - 3\sqrt{6} - 6\sqrt{3} + 2\sqrt{6}$
 $= 2\sqrt{3} - \sqrt{6}$

14. 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 $5\sqrt{3} + \frac{15}{\sqrt{3}} - 2\sqrt{75}$
 $= 5\sqrt{3} + \frac{15\sqrt{3}}{3} - 10\sqrt{3}$
 $= 5\sqrt{3} + 5\sqrt{3} - 10\sqrt{3} = 0$

15. $\sqrt{32} + \frac{8}{\sqrt{2}} - \sqrt{50} = a\sqrt{2}$, $\sqrt{0.2} \times \sqrt{\frac{4}{5}} \times \sqrt{125} = b\sqrt{5}$ 일 때, $a - b$ 의 값은?

① -2

② -1

③ 1

④ 2

⑤ 3

해설

$$4\sqrt{2} + 4\sqrt{2} - 5\sqrt{2} = 3\sqrt{2} \quad \therefore a = 3$$

$$\begin{aligned} \sqrt{\frac{20}{100}} \times \frac{2\sqrt{5}}{5} \times 5\sqrt{5} &= \frac{\sqrt{5}}{5} \times \frac{2\sqrt{5}}{5} \times 5\sqrt{5} \\ &= 2\sqrt{5} \end{aligned}$$

$$\therefore b = 2$$

$$\therefore a - b = 1$$

16. 다음 보기 중에서 옳지 않은 것은?

① $\sqrt{8} - \sqrt{18} + \sqrt{32} = 3\sqrt{2}$

② $\sqrt{27} - \sqrt{48} + \sqrt{75} = 4\sqrt{3}$

③ $-\frac{2}{\sqrt{2}} + \frac{32}{\sqrt{32}} = 4\sqrt{2}$

④ $\sqrt{5} + \sqrt{125} - \sqrt{32} + 3\sqrt{2} = 6\sqrt{5} - \sqrt{2}$

⑤ $\sqrt{12} + 3\sqrt{3} - \sqrt{7} + \sqrt{63} = 5\sqrt{3} + 2\sqrt{7}$

해설

③ $3\sqrt{2}$

17. $\frac{7+6\sqrt{6}}{\sqrt{3}}-4\left(\sqrt{2}+\frac{\sqrt{3}}{3}\right)$ 을 간단히 하면?

① $\sqrt{2}-2\sqrt{3}$

② $\sqrt{2}+2\sqrt{3}$

③ $\sqrt{3}-2\sqrt{2}$

④ $\sqrt{3}+2\sqrt{2}$

⑤ $\sqrt{5}-2\sqrt{2}$

해설

$$\begin{aligned}& \frac{7+6\sqrt{6}}{\sqrt{3}}-4\left(\sqrt{2}+\frac{\sqrt{3}}{3}\right) \\&= \frac{7\sqrt{3}+6\sqrt{18}}{3}-4\sqrt{2}-\frac{4\sqrt{3}}{3} \\&= \frac{3\sqrt{3}+18\sqrt{2}}{3}-4\sqrt{2}=\sqrt{3}+2\sqrt{2}\end{aligned}$$

18. 다음 중 옳은 것은?

① $\sqrt{7} - \sqrt{3} - \sqrt{2} = \sqrt{2}$

② $\sqrt{0.02} \times \sqrt{2} = 0.2$

③ $\sqrt{6} + \sqrt{4} = \sqrt{10}$

④ $3\sqrt{2} \times \sqrt{12} \div \frac{1}{\sqrt{3}} = 6\sqrt{2}$

⑤ $2\sqrt{2} + \sqrt{18} - \sqrt{50} = -2\sqrt{30}$

해설

④ $3\sqrt{2} \times 2\sqrt{3} \times \sqrt{3} = 18\sqrt{2}$

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

19. $A = \sqrt{2} + \sqrt{3}$, $B = \sqrt{6} - \sqrt{3}$ 일 때, $\sqrt{2}A - \sqrt{3}B$ 의 값은?

① $\sqrt{6} - 3\sqrt{2} + 5$

② $\sqrt{6} + 3\sqrt{2} - 5$

③ $\sqrt{6} - 3\sqrt{2} - 5$

④ $-\sqrt{6} - 3\sqrt{2} + 5$

⑤ $-\sqrt{6} + 3\sqrt{2} - 5$

해설

$$\sqrt{2}(\sqrt{2} + \sqrt{3}) - \sqrt{3}(\sqrt{6} - \sqrt{3}) = \sqrt{6} - 3\sqrt{2} + 5$$

20. $\sqrt{96} + \frac{\sqrt{3}(\sqrt{2} - \sqrt{6})}{\sqrt{2}} - \frac{\sqrt{6} - 1}{\sqrt{2}} \div \frac{2\sqrt{2}}{\sqrt{3}}$ 를 간단히 하면?

① $4\sqrt{6} - \frac{5}{4}\sqrt{3} - \frac{3}{4}\sqrt{2} - 3$

③ $4\sqrt{6} - \frac{5}{4}\sqrt{3} + \frac{3}{4}\sqrt{2} - 3$

⑤ $4\sqrt{6} + \frac{5}{4}\sqrt{3} + \frac{3}{4}\sqrt{2} - 3$

② $4\sqrt{6} + \frac{5}{4}\sqrt{3} - \frac{3}{4}\sqrt{2} - 3$

④ $4\sqrt{6} - \frac{5}{4}\sqrt{3} - \frac{3}{4}\sqrt{2} + 3$

해설

$$\begin{aligned}(\text{준식}) &= 4\sqrt{6} + \sqrt{3} - 3 - \frac{3\sqrt{2} - \sqrt{3}}{4} \\ &= 4\sqrt{6} + \frac{5}{4}\sqrt{3} - \frac{3}{4}\sqrt{2} - 3\end{aligned}$$

21. 일차방정식 $(\sqrt{2}-2)x = (3-\sqrt{2})(3\sqrt{2}+1)$ 을 풀면?

- ① $-1 - \frac{13}{2}\sqrt{2}$ ② $-2 - \frac{13}{2}\sqrt{2}$ ③ $-3 - \frac{13}{2}\sqrt{2}$
④ $-4 - \frac{13}{2}\sqrt{2}$ ⑤ $-5 - \frac{13}{2}\sqrt{2}$

해설

$$\begin{aligned} x &= \frac{8\sqrt{2}-3}{\sqrt{2}-2} = \frac{(8\sqrt{2}-3)(\sqrt{2}+2)}{(\sqrt{2}-2)(\sqrt{2}+2)} \\ &= \frac{10+13\sqrt{2}}{-2} = -5 - \frac{13}{2}\sqrt{2} \end{aligned}$$

22. $\frac{4+\sqrt{3}}{\sqrt{2}}$ 과 $\frac{2-\sqrt{3}}{\sqrt{6}}$ 의 합을 구하면?

- ① $\frac{9\sqrt{2}+5\sqrt{6}}{6}$ ② $\frac{9\sqrt{2}-5\sqrt{6}}{6}$ ③ $\frac{5\sqrt{2}+9\sqrt{6}}{6}$
④ $\frac{5\sqrt{2}-9\sqrt{6}}{6}$ ⑤ $\frac{-5\sqrt{2}+9\sqrt{6}}{6}$

해설

$$\begin{aligned} & \frac{4+\sqrt{3}}{\sqrt{2}} + \frac{2-\sqrt{3}}{\sqrt{6}} \\ &= \frac{(4+\sqrt{3}) \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} + \frac{(2-\sqrt{3}) \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} \\ &= \frac{4\sqrt{2}+\sqrt{6}}{2} + \frac{2\sqrt{6}-3\sqrt{2}}{6} \\ &= \frac{12\sqrt{2}+3\sqrt{6}+2\sqrt{6}-3\sqrt{2}}{6} \\ &= \frac{9\sqrt{2}+5\sqrt{6}}{6} \end{aligned}$$

23. $\frac{1}{\sqrt{2}} - \frac{3}{\sqrt{32}}$ 을 계산하면?

① $\frac{1}{2}$

② $-\frac{1}{2}$

③ $\frac{\sqrt{2}}{8}$

④ $-\frac{\sqrt{3}}{8}$

⑤ $\frac{\sqrt{3}}{8}$

해설

$$\begin{aligned}\frac{1}{\sqrt{2}} - \frac{3}{4\sqrt{2}} &= \frac{\sqrt{2}}{\sqrt{2}\sqrt{2}} - \frac{3\sqrt{2}}{4\sqrt{2}\sqrt{2}} \\ &= \frac{\sqrt{2}}{\sqrt{2}} - \frac{3\sqrt{2}}{4\sqrt{2}} \\ &= \frac{2}{4\sqrt{2}} - \frac{3\sqrt{2}}{8} \\ &= \frac{8}{\sqrt{2}} - \frac{3\sqrt{2}}{8} \\ &= \frac{\sqrt{2}}{8}\end{aligned}$$

24. $\sqrt{12} - 3\sqrt{48} - \sqrt{3} + \sqrt{27} = A\sqrt{3}$ 일 때, 유리수 A 의 값은?

① -5

② -6

③ -7

④ -8

⑤ -9

해설

$$\begin{aligned} & \sqrt{12} - 3\sqrt{48} - \sqrt{3} + \sqrt{27} \\ &= 2\sqrt{3} - 12\sqrt{3} - \sqrt{3} + 3\sqrt{3} \\ &= -8\sqrt{3} \end{aligned}$$

따라서 $A = -8$ 이다.

25. $\sqrt{3}(3 - \sqrt{3}) + \sqrt{75}$ 를 간단히 하면?

① $5\sqrt{3} - 3$

② $6\sqrt{3} - 2$

③ $7\sqrt{3} - 2$

④ $7\sqrt{3} - 3$

⑤ $8\sqrt{3} - 3$

해설

$$3\sqrt{3} - 3 + 5\sqrt{3} = 8\sqrt{3} - 3$$