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

$$\begin{aligned}(\text{준식}) &= 2\sqrt{5\times5\times2} - \sqrt{7\times7\times2} + \sqrt{3\times3\times2} \\ &= 10\sqrt{2} - 7\sqrt{2} + 3\sqrt{2} \\ &= 6\sqrt{2}\end{aligned}$$

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

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

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

$=8\sqrt{6}-7\sqrt{3}$

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

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

5. 다음 중 계산이 <u>틀린</u> 것은?

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

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

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

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

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

해설

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

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

$\sqrt{48}-4\sqrt{32}+3\sqrt{12}+\sqrt{50}$

$=4\sqrt{3}-16\sqrt{2}+6\sqrt{3}+5\sqrt{2}$

$=10\sqrt{3}-11\sqrt{2}$ 에서

$a=10,\ b=-11$

$\therefore a+b=-1$

8. 다음 중 $\sqrt{18}+2\sqrt{2}-\dfrac{2}{\sqrt{2}}$ 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 <u>틀린</u> 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?

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

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

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

$$=\frac{3\sqrt{2}}{2}+\frac{5\sqrt{2}}{2}-\left(2\sqrt{2}+2\sqrt{3}\right)$$

$$=4\sqrt{2}-\left(2\sqrt{2}+2\sqrt{3}\right)$$

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

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

$\sqrt{108} - \sqrt{48} - \sqrt{27} + \sqrt{24}$

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

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

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

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

① -2 ② -1 ③ 1 ④ 2 ⑤ 3

해설

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

$$\sqrt{\frac{20}{100}}\times\frac{2\sqrt{5}}{5}\times5\sqrt{5}=\frac{\sqrt{5}}{5}\times\frac{2\sqrt{5}}{5}\times5\sqrt{5}$$

$$=2\sqrt{5}$$

$\therefore$ $b=2$

$\therefore$ $a-b=1$

16. 다음 보기 중에서 옳지 <u>않은</u> 것은?

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

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

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

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. $\dfrac{7+6\sqrt{6}}{\sqrt{3}} - 4\left(\sqrt{2}+\dfrac{\sqrt{3}}{3}\right)$ 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

$$\frac{7+6\sqrt{6}}{\sqrt{3}} - 4\left(\sqrt{2}+\frac{\sqrt{3}}{3}\right)$$

$$= \frac{7\sqrt{3}+6\sqrt{18}}{3} - 4\sqrt{2} - \frac{4\sqrt{3}}{3}$$

$$= \frac{3\sqrt{3}+18\sqrt{2}}{3} - 4\sqrt{2} = \sqrt{3}+2\sqrt{2}$$

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

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

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

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

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

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

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

해설

$$(\text{준식})=4\sqrt{6}+\sqrt{3}-3-\frac{3\sqrt{2}-\sqrt{3}}{4}$$

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

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

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

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

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

$$=\frac{\left(4+\sqrt{3}\right)\times\sqrt{2}}{\sqrt{2}\times\sqrt{2}}+\frac{\left(2-\sqrt{3}\right)\times\sqrt{6}}{\sqrt{6}\times\sqrt{6}}$$

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

$$=\frac{12\sqrt{2}+3\sqrt{6}+2\sqrt{6}-3\sqrt{2}}{6}$$

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

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

$$\frac{1}{\sqrt{2}} - \frac{3}{4\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2}\sqrt{2}} - \frac{3\sqrt{2}}{4\sqrt{2}\sqrt{2}}$$
$$= \frac{\sqrt{2}}{2} - \frac{3\sqrt{2}}{8}$$
$$= \frac{4\sqrt{2}}{8} - \frac{3\sqrt{2}}{8}$$
$$= \frac{\sqrt{2}}{8}$$

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

$\sqrt{12} - 3\sqrt{48} - \sqrt{3} + \sqrt{27}$
$= 2\sqrt{3} - 12\sqrt{3} - \sqrt{3} + 3\sqrt{3}$
$= -8\sqrt{3}$
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

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