1. $(3x-4)^2+a=9x^2+bx+10$ 일 때, $a+b$ 의 값은? (단, a, b 는 상수이다.)

① -36 ② -30 ③ -24 ④ -18 ⑤ -12

해설

$(3x)^2-2\times 3x\times 4+4^2+a$
$=9x^2-24x+16+a$
$16+a=10$
$a=-6,\ b=-24$
$\therefore\ a+b=-30$

2. $\left(6a+\frac{1}{3}\right)^2$ 을 전개하면?

① $6a^2+2a+\frac{1}{3}$ ② $6a^2+4a+\frac{1}{9}$ ③ $36a^2+2a+\frac{1}{9}$
④ $36a^2+4a+\frac{1}{9}$ ⑤ $36a^2+4a+\frac{2}{3}$

해설

$(6a)^2+2\times 6a\times\frac{1}{3}+\left(\frac{1}{3}\right)^2=36a^2+4a+\frac{1}{9}$

3. $a>0,\ b>0,\ \sqrt{ab}=2$ 일 때, $a\sqrt{\dfrac{2b}{a}}+b\sqrt{\dfrac{a}{b}}$ 를 구하면?

① 2　② $2+\sqrt{2}$　③ $2+2\sqrt{2}$

④ $2+3\sqrt{2}$　⑤ $2+4\sqrt{2}$

해설

$$\begin{aligned}(\text{준식}) &= \sqrt{a^2\times\frac{2b}{a}}+\sqrt{b^2\times\frac{a}{b}}\\ &= \sqrt{2ab}+\sqrt{ab}\\ &= 2\sqrt{2}+2\end{aligned}$$

4. $x=\dfrac{2\sqrt{2}+\sqrt{5}}{4}$, $y=\dfrac{2\sqrt{2}-\sqrt{5}}{4}$ 일 때, $\dfrac{x+y}{x-y}$ 의 값은?

① $\dfrac{\sqrt{10}}{3}$ ② $\dfrac{2\sqrt{10}}{3}$ ③ $\dfrac{\sqrt{10}}{5}$

④ $\dfrac{2\sqrt{10}}{5}$ ⑤ $\dfrac{\sqrt{10}}{7}$

해설

$$x+y=\frac{2\sqrt{2}+\sqrt{5}+2\sqrt{2}-\sqrt{5}}{4}=\frac{4\sqrt{2}}{4}=\sqrt{2}$$

$$x-y=\frac{2\sqrt{2}+\sqrt{5}-(2\sqrt{2}-\sqrt{5})}{4}=\frac{2\sqrt{5}}{4}=\frac{\sqrt{5}}{2}$$

$$\therefore \frac{x+y}{x-y}=\frac{\sqrt{2}}{\frac{\sqrt{5}}{2}}=\frac{2\sqrt{2}}{\sqrt{5}}=\frac{2\sqrt{10}}{5}$$

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

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

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

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

7. $0 < x < 2$ 일 때,
$\sqrt{(-x)^2} - \sqrt{(x-2)^2} + \sqrt{(2-x)^2}$ 을 간단히 하면?

① x ② $4-x$ ③ $x+4$
④ $3x+4$ ⑤ $4-3x$

해설

$0 < x < 2$ 에서 $-x < 0, x-2 < 0, 2-x > 0$
$\sqrt{(-x)^2} - \sqrt{(x-2)^2} + \sqrt{(2-x)^2}$
$= -(-x) - \{-(x-2)\} + (2-x)$
$= x + (x-2) + (2-x) = x$

8. $a < 5$ 일 때, $\sqrt{(a-5)^2} - \sqrt{(-a+5)^2}$ 을 바르게 계산한 것은?

① $-2a-10$　② $-2a$　③ 0

④ $2a$　⑤ $2a+10$

해설

$\sqrt{(a-5)^2} - \sqrt{(-a+5)^2} = -(a-5) - (-a+5)$
$= -a+5+a-5 = 0$