1. $\dfrac{2x-5}{3}-\dfrac{x-7}{4}=Ax+B$ 일 때, $A-B$ 의 값은?

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

해설

$$\frac{2x-5}{3}-\frac{x-7}{4}=\frac{8x-20-3x+21}{12}=\frac{5x+1}{12}=\frac{5}{12}x+\frac{1}{12}$$

$$A=\frac{5}{12},\quad B=\frac{1}{12}$$

$$\therefore A-B=\frac{5}{12}-\frac{1}{12}=\frac{4}{12}=\frac{1}{3}$$

2. $(3x-4)-(x+3)$ 을 간단히 하면?

① $2x-1$ ② $2x+1$ ③ $2x-12$

④ $2x+7$ ⑤ $2x-7$

해설

$(3x-4)-(x+3)$

$=3x-4-x-3=2x-7$

3. 식 $(2x+3y+1)-(2x+y-3)$ 을 간단히 하면?

① $2x+2y-3$ ② $2x+2y+1$ ③ $2x+4$

④ $2y+4$ ⑤ -3

해설

$(2x+3y+1)-(2x+y-3)=2x+3y+1-2x-y+3=2y+4$

4. $\dfrac{6x^2-9x}{3x}-\dfrac{x^2-8x-4}{2}=ax^2+bx+c$에서 $ab-c$의 값을 구하면?

① -4 ② -2 ③ 0 ④ 2 ⑤ 4

해설

$$\frac{6x^2-9x}{3x}=2x-3$$

$$2x-3-\frac{1}{2}x^2+4x+2=-\frac{1}{2}x^2+6x-1$$

$$\therefore\ a=-\frac{1}{2},\ b=6,\ c=-1$$

$$\therefore\ ab-c=\left(-\frac{1}{2}\right)\times 6-(-1)=-3+1=-2$$

5. 식 $(7x^2 - 5x + 6) - (3x^2 - 2x + 4)$를 간단히 하면?

① $4x^2 - 3x + 2$ ② $4x^2 - 3x + 10$ ③ $4x^2 - 7x - 2$

④ $4x^2 - 7x + 2$ ⑤ $4x^2 - 7x + 10$

해설

$$(7x^2 - 5x + 6) - (3x^2 - 2x + 4)$$
$$= 7x^2 - 5x + 6 - 3x^2 + 2x - 4$$
$$= 4x^2 - 3x + 2$$

6. 다음 $\square$ 안에 알맞은 식을 구하여라.

$$\frac{3}{5}a^2-\frac{1}{3}a+\frac{1}{7}+\square=a^2-\frac{3}{4}a+\frac{1}{2}$$

① $\frac{2}{5}a^2-\frac{5}{12}a+\frac{5}{14}$
② $\frac{3}{5}a^2-\frac{3}{4}a-\frac{5}{7}$
③ $-\frac{2}{5}a^2-\frac{1}{6}a+\frac{5}{7}$
④ $\frac{2}{5}a^2+\frac{5}{12}a+\frac{5}{14}$
⑤ $\frac{3}{5}a^2+\frac{3}{4}a-\frac{5}{7}$

해설

$$\square=a^2-\frac{3}{4}a+\frac{1}{2}-\left(\frac{3}{5}a^2-\frac{1}{3}a+\frac{1}{7}\right)$$
$$=a^2-\frac{3}{4}a+\frac{1}{2}-\frac{3}{5}a^2+\frac{1}{3}a-\frac{1}{7}$$
$$=\frac{2}{5}a^2-\frac{5}{12}a+\frac{5}{14}$$

7. $243^5 \div 81^n = 27^3$ 일 때, n 의 값은?

① 1 ② 2 ③ 3 ④ 4 ⑤ 5

해설

$(3^5)^5 \div 3^{4n} = 3^{25-4n} = 3^9$

$25 - 4n = 9$

$\therefore\ n = 4$

8. $(x^2)^a \div (-x)^2 = x^4$, $y^3 \div (y^b)^2 = \frac{1}{y}$, $(z^2)^5 \div z^2 \div (-z^c)^3 = -\frac{1}{z^4}$ 을 만족할 때, $a+b+c$ 의 값은?

① 3 ② 6 ③ 9 ④ 12 ⑤ 15

해설

$(x^2)^a \div (-x)^2 = x^{2a} \div x^2 = x^4$

$2a-2=4$

$\therefore\ a=3$

$y^3 \div (y^b)^2 = y^3 \div y^{2b} = \frac{1}{y} = y^{-1},\ 3-2b=-1$

$\therefore\ b=2$

$(z^2)^5 \div z^2 \div (-z^c)^3 = z^{10} \div z^2 \div (-z^{3c}) = -\frac{1}{z^4} = -z^{-4}$

$10-2-3c=-4$

$\therefore\ c=4$

$a=3$, $b=2$, $c=4$

$\therefore a+b+c=9$

9. $(x^{\square})^5 \div x^6 = x^4$ 일 때, $\square$ 안에 알맞은 것은?

① 1 ② 2 ③ 3 ④ 4 ⑤ 5

해설

$\square$를 a 라 하면

$x^{5a} \div x^6 = x^4$

$x^{5a-6} = x^4$

$5a - 6 = 4$

$\therefore\ a = 2$

10. 다음 식의 값을 구하면?

$$\frac{x^2yz - 2xy + xy^2z}{xyz} \text{ (단, } x = \frac{1}{2}, y = \frac{1}{3}, z = 6 \text{)}$$

① $\frac{1}{2}$ ② $\frac{1}{3}$ ③ $\frac{1}{6}$ ④ $\frac{5}{6}$ ⑤ 0

해설

$$\begin{aligned}\frac{x^2yz - 2xy + xy^2z}{xyz} &= \frac{x^2yz}{xyz} - \frac{2xy}{xyz} + \frac{xy^2z}{xyz} \\ &= x - \frac{2}{z} + y \\ &= \frac{1}{2} - \frac{2}{6} + \frac{1}{3} \\ &= \frac{1}{2}\end{aligned}$$

11. $a=1$ 일 때, $2a(5a-3)-4a(3a-2)$ 의 값은?

① 0 ② 1 ③ 2 ④ 3 ⑤ 4

해설

$$2a(5a-3)-4a(3a-2)=10a^2-6a-12a^2+8a$$
$$=-2a^2+2a$$

$\therefore\ -2a^2+2a=-2+2=0$

12. $x=-\frac{1}{3},\ y=3$ 일 때 $3xy(x-y)-(4x^2y^3-4x^3y^2)\div 2xy$ 의 값은?

① $\frac{50}{3}$ ② $-\frac{50}{3}$ ③ $\frac{40}{3}$ ④ $-\frac{40}{3}$ ⑤ $\frac{35}{3}$

해설

$$(\text{준식}) = 3x^2y-3xy^2-2xy^2+2x^2y$$
$$= 5x^2y-5xy^2$$

$x=-\frac{1}{3},\ y=3$ 을 대입하면

$$5\times\left(\frac{1}{9}\right)\times 3-5\times\left(-\frac{1}{3}\right)\times 9=\frac{5}{3}+\frac{45}{3}=\frac{50}{3}$$