

stress test

1. $(a^2b^x)^3 \div a^yb^3 = a^5b^9$ 이 ¼ ẽ , $x + y$ ì ê° ì ?

[배점 2, 하중]

- ① 2 ② 3 ③ 4 ④ 5 ⑤ 6

해설

$$(a^2b^x)^3 \div a^yb^3$$

$$= a^6b^{3x} \times \frac{1}{a^yb^3}$$

$$= a^{6-y}b^{3x-3}$$

$$= a^5b^9$$

$$6 - y = 5 \quad \therefore y = 1$$

$$3x - 3 = 9 \quad \therefore x = 4$$

$$\therefore x + y = 5$$

2. $18ab^2 \div 3a^2b \div 4a^3b^3 \times 2a^5b^3$ ì ê° ẽ ¨í í ì -ẽ ¼.

[배점 2, 하중]

▶ 답 :

▶ 정답 : $3ab$

해설

$$\frac{18ab^2 \times 2a^5b^3}{3a^2b \times 4a^3b^3} = 3ab$$

3. ẽ ¨ì ì ¨ ì ¨ ì ¨ ì ¨ ê² ì ?

[배점 2, 하중]

① $3^5 \div 9^2 = 1$

② $(x^2)^3 \times (x^3)^4 = x^{18}$

③ $\left(\frac{x^4}{y^2}\right)^3 = \frac{x^{12}}{y^6}$

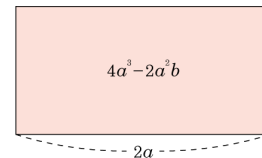
④ $(x^2y^5)^4 = x^8y^{20}$

⑤ $(a^2b)^3 \div a^2 = a^4b^3$

해설

① $3^5 \div 9^2 = 3^5 \div (3^2)^2 = 3$

4. ẽ° ẽ©'ì ê° ẽì ì ê¸ì 'ê° $2a$ ì , ì§ì -ê° í ì ẽ ì 'ê° $4a^3 - 2a^2b$ ì ¼ ẽ , ì , ẽì ì ê¸ì 'ẽ ?



[배점 2, 하중]

① $a^2 - a$

② $2a^2 + a$

③ $2a^2 - b$

④ $2a^2 - ab$

⑤ $2a^2 + ab$

해설

$$2a \times (\text{ì , ẽì ì ê¸ì '}) = 4a^3 - 2a^2b$$

$$\begin{aligned} \therefore (\text{ì , ẽì ì ê¸ì '}) &= \frac{4a^3 - 2a^2b}{2a} \\ &= \frac{4a^3}{2a} + \frac{-2a^2b}{2a} \\ &= 2a^2 - ab \end{aligned}$$

해설

$$\begin{aligned}
 & x + 4y - \{2x - (3y - \square + y) + y\} \\
 &= x + 4y - (2x - 3y + \square - y + y) \\
 &= x + 4y - (2x - 3y + \square) \\
 &= -x + 7y - \square \\
 &-x + 7y - \square = 5x - 3x - 2y = 2x - 2y \\
 \therefore \square &= -x + 7y - 2x + 2y = -3x + 9y
 \end{aligned}$$

14. a, b 가 $3x - 5y - \{y - 2(2x + 3y)\} = ax + by$ 와 같고, $a + b$ 의 값을 구하시오. [배점 3, 중하]

▶ 답 :

▷ 정답 : 7

해설

$$\begin{aligned}
 & 3x - 5y - \{y - 2(2x + 3y)\} \\
 &= 3x - 5y - (y - 4x - 6y) \\
 &= 3x - 5y - (-4x - 5y) \\
 &= 3x - 5y + 4x + 5y \\
 &= 3x + 4x - 5y + 5y \\
 &= (3 + 4)x + (-5 + 5)y \\
 &= 7x \\
 &\therefore a = 7, b = 0 \text{ 이다.} \\
 \therefore a + b &= 7 + 0 = 7
 \end{aligned}$$

15. $(2x + ay)^2 = bx^2 + cxy + 9y^2$ 이고, $a - b + c$ 의 값을 구하시오. ($a > 0$) [배점 3, 중하]

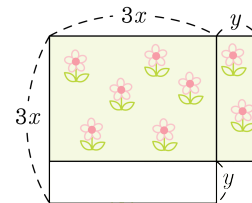
▶ 답 :

▷ 정답 : 11

해설

$$\begin{aligned}
 (2x + ay)^2 &= 4x^2 + 4axy + a^2y^2 \\
 4x^2 + 4axy + a^2y^2 &= bx^2 + cxy + 9y^2 \\
 \therefore b &= 4 \\
 a^2 &= 9 \\
 \therefore a &= 3 (\because a > 0) \\
 4a &= c \\
 \therefore c &= 12 \\
 a - b + c &= 3 - 4 + 12 = 11
 \end{aligned}$$

16. $9x^2 + 6xy + y^2$ 를 $(3x + y)^2$ 로 나타내면, $(3x + y)^2$ 의 전개식에서 xy 의 계수를 구하시오. [배점 3, 중하]



[배점 3, 중하]

- ① $9x^2 + 6xy + y^2(m^2)$
 ② $9x^2 - 6xy + y^2(m^2)$
 ③ $6x^2 - y^2(m^2)$
 ④ $9x^2 - y^2(m^2)$
 ⑤ $9x^2 + y^2(m^2)$

$$\begin{aligned} \tilde{e}^3 \dot{1} \ddot{e} \quad \hat{e}^{\frac{1}{2}} \ddot{e}^{\circ} \dot{1} \quad \hat{e}^{\circ} \ddot{e} \dot{1} \quad \hat{e}_{\text{,}} \dot{1} \text{ ' } \ddot{e} \quad 3x + y(\text{cm}), \\ \dot{1}_{\text{,}} \ddot{e} \dot{1} \quad \hat{e}_{\text{,}} \dot{1} \text{ ' } \ddot{e} \quad 3x - y(\text{cm}) \quad \dot{1} \text{ ' } \ddot{e} \propto. \quad \ddot{e}^{\circ} \ddot{e}^{\frac{1}{4}} \dot{1} \\ \tilde{e}^3 \dot{1} \ddot{e} \quad \hat{e}^{\frac{1}{2}} \ddot{e}^{\circ} \dot{1} \quad \ddot{e} \dot{1} \text{ ' } \ddot{e} \quad (3x + y)(3x - y) = \\ 9x^2 - y^2(\text{cm}^2) \dot{1} \text{ ' } \ddot{e} \propto. \end{aligned}$$

$$17. \left(\frac{xy^b}{x^ay^3} \right)^3 = \frac{y^9}{x^3} \text{ if } a + b = 6 \text{ and } a \neq 3.$$

[배점 4, 중중]

▶ 답:

▶ 정답 : 8

해설

$$\left(\frac{xy^b}{x^ay^3}\right)^3 = \frac{x^3y^{3b}}{x^{3a}y^9} = \frac{y^9}{x^3}$$

$$3a = 6 \quad \therefore a = 2$$

$$3b = 18 \quad \therefore b = 6$$

$$\therefore a + b = 8$$

18. $(\frac{1}{3})^{2x-1} = 27^{x+2}$ $\Rightarrow \frac{1}{3} \cdot 3 = 3^3 \cdot 3^6 = 3^9$ $\Rightarrow 2x-1 = 9$ $\Rightarrow 2x = 10$ $\Rightarrow x = 5$

[배점 4, 중중]

▶ 답 :

▶ 정답 : -1

해설

$$3^{-2x+1} = (3^3)^{x+2}$$

$$-2x + 1 = 3x + 6, x = -1$$

19. $A = \{x, y \mid -x - 2y + 4 \leq 0, 4x + y - 3 \leq 0\}$. A ăe ?

[배점 4, 중중]

① $-x + 2y - 7$

② $-x + 3y - 3$

③ $5x - 2y + 4$

④ $5x + 3y - 7$

⑤ $5x + 3y + 7$

해설

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

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

$$= 4x + y - 3 + x + 2y - 4$$

$$= 5x + 3y - 7$$

[illegible]

[배점 4, 종종]

① $x^2 + x + 1$

② $x^2 - 2x$

③ $3x^2 - 2x + 1$

④ $3x^2 + 2$

⑤ $-3x^2 - 3x + 1$

해설

$$\begin{aligned}
 & (A \text{의 넓이}) \\
 &= \pi \left(\frac{2a+2b}{2} \right)^2 \times \frac{1}{2} - \pi a^2 \times \frac{1}{2} + \pi b^2 \times \frac{1}{2} \\
 &= \frac{\pi}{2} \{ (a+b)^2 - a^2 + b^2 \} \\
 &= \frac{\pi}{2} (2ab + 2b^2) \\
 &= \pi (ab + b^2) \\
 & (B \text{의 넓이}) \\
 &= \pi \left(\frac{2a+2b}{2} \right)^2 \times \frac{1}{2} + \pi a^2 \times \frac{1}{2} - \pi b^2 \times \frac{1}{2} \\
 &= \frac{\pi}{2} \{ (a+b)^2 + a^2 - b^2 \} \\
 &= \frac{\pi}{2} (2ab + 2a^2) \\
 &= \pi (ab + a^2) \\
 \therefore B - A &= \pi (ab + a^2) - \pi (ab + b^2) \\
 &= \pi (a^2 - b^2) = \pi (a-b)(a+b)
 \end{aligned}$$

25. $(2x-y+1)^2$ 의 x^2 의 계수는 xy 의 계수의 $\frac{1}{4}$ A , x 의 계수의 $\frac{1}{4}$ B 의 계수, $A+B$ 의 값은 $\square$ 이다.
[배점 5, 중상]

▶ 답:

▷ 정답: 0

해설

$$\begin{aligned}
 & (2x-y+1)(2x-y+1) \\
 &= 4x^2 - 2xy + 2x - 2xy + y^2 - y + 2x - y + 1 \\
 &= 4x^2 - 4xy + y^2 + 4x - 2y + 1 \\
 & xy \text{의 계수는 } -4, x^2 \text{의 계수는 } 4 \text{이다.} \\
 & \therefore A = -4, B = 4 \text{이다.} \\
 & A + B = 0
 \end{aligned}$$