

stress test

1. $(a^2b^x)^3 \div a^y b^3 = a^5 b^9$ 이 $\frac{1}{4}$ 데 , $x + y$ 이 60° 이 ?
[배점 2, 하중]

① 2 ② 3 ③ 4 ④ 5 ⑤ 6

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

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

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

$$= a^5 b^9$$

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

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

$$\therefore x + y = 5$$

$$8ab^2 \div 3a^2b \div 4a^3b^3 \times 2a^5b^3 = \frac{16a^8b^6}{12a^5b^6} = \frac{4a^3}{3}$$

[배점 2, 하중]

四：

▶ 정답 : $3ab$

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

- ### 3. ẽ øì ìø ì³i§ ì ì ê² ì ? [배점 2, 하중]

$$\textcircled{1} \quad 3^5 \div 9^2 = 1$$

$$\textcircled{2} \quad (x^2)^3 \times (x^3)^4 = x^{18}$$

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

$$\textcircled{4} \quad (x^2y^5)^4 = x^8y^{20}$$

$$\textcircled{5} \quad (a^2b)^3 \div a^2 = a^4b^3$$

해설

$$\textcircled{1} \quad 3^5 \div 9^2 = 3^5 \div (3^2)^2 = 3$$

4. $\ddot{e}^o \ddot{e} @`i \quad \hat{e}^o \ddot{e} j i \quad \hat{e}, i \quad \hat{e}^o \quad 2a \quad i, \quad i \ddot{e} i \quad -\hat{e}^o \quad i \quad \ddot{e} \quad i \quad \hat{e}^o$
 $4a^3 - 2a^2 b \quad i \frac{1}{4} \ddot{e}, \quad i \quad \ddot{e} j i \quad \hat{e}, i \quad \hat{e}^o \quad ?$

$$4a^3 = 2a^2 b$$

[배점 2, 하중]

- ① $a^2 - a$ ② $2a^2 + a$ ③ $2a^2 - b$
④ $2a^2 - ab$ ⑤ $2a^2 + ab$

해설

$$2a \times (\hat{e}_1 \hat{e}_2 \hat{e}_3) = 4a^3 - 2a^2b$$

$$\therefore (\hat{e}_1 \hat{e}_2 \hat{e}_3) = \frac{4a^3 - 2a^2b}{2a}$$

$$= \frac{4a^3}{2a} + \frac{-2a^2b}{2a}$$

$$= 2a^2 - ab$$

5. $5^{x+3} = 5^x \times \boxed{\quad} + \boxed{\quad}$ է ՞ է ?
[배점 3, 하상]

- ① 25 ② 5 ③ 625
④ 125 ⑤ 75

해설

$$5^{x+3} = 5^x \times 5^3$$

6. $\frac{-4x^2 + 2x}{x} - \frac{3y^2 - 2xy}{y}$ է ՞ է , x ի է³ և y ի է³ և a , b ի է^{1/4} և $a = b$ է^{1/4} է , ab ի է^{1/4} ?
[배점 3, 하상]

- ① 8 ② 6 ③ 4 ④ -2 ⑤ -4

해설

$$\begin{aligned} & \frac{-4x^2 + 2x}{x} - \frac{3y^2 - 2xy}{y} \\ &= -4x + 2 - 3y + 2x \\ &= -2x - 3y + 2 \\ &a = -2, b = -3 \\ &\therefore ab = 6 \end{aligned}$$

7. $(a^2b - a^2) \div a - 2(ab^2 + 6b^2) \div b$ է ՞ է , ab ի է³ և x , a ի է³ և y է^{1/4} և $3x - y$ ի է^{1/4}.
[배점 3, 하상]

▶ 답 :

▷ 정답 : -2

해설

$$\begin{aligned} (ab - a - 2ab - 12b) \\ = -a - ab - 12b \\ \therefore 3x - y = 3(-1) - (-1) = -2 \end{aligned}$$

8. $4x - 3y + 2 = 5x - 6y + 3$ է , $2x - 9y + 5$ է , x ի է^{1/4} և y ի է^{1/4}?
[배점 3, 하상]

- ① -3y + 3 ② -7x - 4 ③ -3y - 3

- ④ 7x - 4 ⑤ 7x + 4

해설

$$\begin{aligned} 4x - 3y + 2 &= 5x - 6y + 3 \\ x &= 3y - 1 \\ 2x - 9y + 5 &= 6y - 2 - 9y + 5 = -3y + 3 \end{aligned}$$

9. $(a + b + c)^2$ է ՞ է ?
[배점 3, 하상]

① $a^2 + b^2 + c^2$

② $a^2 + b^2 + c^2 + ab + bc + ca$

③ $a^2 + b^2 + c^2 + a + b + c$

④ $a^2 + b^2 + c^2 + 2a + 2b + 2c$

⑤ $a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$

해설

$$\begin{aligned}
 a + b &= t e^{\frac{1}{4}} \cdot \ddot{e} \odot' \\
 (a + b + c)^2 &= (t + c)^2 \\
 &= t^2 + 2ct + c^2 \\
 &= (a + b)^2 + 2c(a + b) + c^2 \\
 &= a^2 + 2ab + b^2 + 2ca + 2bc + c^2 \\
 &= a^2 + b^2 + c^2 + 2ab + 2bc + 2ca
 \end{aligned}$$

10. $2^{12} \times 5^{13}$ ì è^a ì è|—ì ì ì ,ì§ êµ—í ì —ë ¼.

[배점 3, 중하]

답

▶ 정답 : 13 ì ë|¬ì ì

해설

$$2^{12} \times 5^{13} = 2^{12} \times 5^{12} \times 5 = (2 \times 5)^{12} \times 5$$

$$= 10^{12} \times 5$$

11. ẽ ɔ̄ì ì ɔ̄ ì ³ì ê² ì ê³ ẽ ¥' ë ©' ? [배점 3, 중하]

$$\textcircled{1} \quad (-3x^3)^2 = -3x^5$$

$$\textcircled{2} \quad (-2^2 x^4 y)^3 = 32x^7 y^3$$

$$\textcircled{3} \quad (2a^2)^4 = 16a^6$$

$$\textcircled{4} \quad \left(-\frac{a^2}{b^4} \right)^2 = \frac{a^4}{b^8}$$

$$\textcircled{5} \quad \left(-\frac{3y^2}{x} \right)^3 = -\frac{27y^5}{x^4}$$

해설

- ① $(-3x^3)^2 = (-3)^2 x^6 = 9x^6$
- ② $(-2^2 x^4 y)^3 = (-2^2)^3 x^{12} y^3 = -64x^{12}y^3$
- ③ $(2a^2)^4 = 16a^8$
- ④ $\left(-\frac{a^2}{b^4}\right)^2 = \frac{a^4}{b^8}$
- ⑤ $\left(-\frac{3y^2}{x}\right)^3 = -\frac{27y^6}{x^3}$

12. è øì ê³ ì ° ìø ì³ì ê² ì èªºè ê³ è¥' è©'?

[배점 3, 중하]

$$\textcircled{1} \quad -(a - 5b) = a + 5b$$

$$\textcircled{2} \quad -x(-3x + y) = 3x^2 - xy$$

$$\textcircled{3} \quad 2x(3x - 6) = 6x^2 - 6x$$

$$\textcircled{4} \quad 3x(2x - 3y) - 2y(x + y) = 6x^2 - 11xy - 2y^2$$

$$\textcircled{5} \quad -x(x - y + 2) + 3y(2x + y + 4) =$$

$$-x^2 + 7xy - 2x + 3y^2 + 12y$$

해설

$$\textcircled{1} \quad -(a - 5b) = -a + 5b$$

$$\textcircled{3} \quad 2x(3x - 6) = 6x^2 - 12x$$

13. ì ì ë øì 'ê° ê° ì ¥ ê° ë "í ì ì
 êu-ñí ì -ë ¼

$$x + 4y - \{2x - (3y - \square + y) + y\} = 5x - (3x + 2y)$$

[배점 3. 중하]

1

▶ 정답 : $-3x + 9y$

해설

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

14. a, b 使得 $3x - 5y - \{y - 2(2x + 3y)\} = ax + by$ 成立， $a + b$ 的值为多少。
[배점 3, 중하]

▶ 답:**▷ 정답:** 7**해설**

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

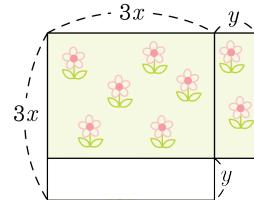
$a = 7, b = 0$ 使得等式成立。
 $\therefore a + b = 7 + 0 = 7$

15. $(2x + ay)^2 = bx^2 + cxy + 9y^2$ 且 $a - b + c$ 的值为多少。
[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. 一个正方形花坛的边长是 $3x$ ，其中包含 y 块花。每块花的面积是 $(3x - y)$ 平方米。
问 y 的值是多少？



[배점 3, 중하]

① $9x^2 + 6xy + y^2$ (m²)

② $9x^2 - 6xy + y^2$ (m²)

③ $6x^2 - y^2$ (m²)

④ $9x^2 - y^2$ (m²)

⑤ $9x^2 + y^2$ (m²)

해설

$$\begin{aligned} & \ddot{\text{e}}^3 \text{ í } \ddot{\text{e}} \quad \ddot{\text{e}}^{1/2} \ddot{\text{e}}^0 \text{-} \ddot{\text{i}} \quad \ddot{\text{e}}^0 \ddot{\text{e}} \text{ } \ddot{\text{j}} \text{ } \ddot{\text{i}} \quad \ddot{\text{e}} \text{ } \ddot{\text{s}}, \ddot{\text{s}} \text{ } \ddot{\text{i}} \text{ } \ddot{\text{e}} \quad 3x + y(\text{cm}), \\ & \ddot{\text{i}}, \ddot{\text{e}} \text{ } \ddot{\text{j}} \text{ } \ddot{\text{i}} \quad \ddot{\text{e}} \text{ } \ddot{\text{s}}, \ddot{\text{s}} \text{ } \ddot{\text{i}} \text{ } \ddot{\text{e}} \quad 3x - y(\text{cm}) \quad \ddot{\text{i}} \text{ } \ddot{\text{e}} \text{ } \ddot{\text{o}} \text{ } \ddot{\text{x}}. \quad \ddot{\text{e}} \text{ } \ddot{\text{o}} \ddot{\text{e}} \text{ } \ddot{\text{1}}/4 \ddot{\text{i}} \\ & \ddot{\text{e}}^3 \text{ í } \ddot{\text{e}} \quad \ddot{\text{e}}^{1/2} \ddot{\text{e}}^0 \text{-} \ddot{\text{i}} \quad \ddot{\text{e}} \text{ } \ddot{\text{i}} \text{ } \ddot{\text{e}} \quad (3x + y)(3x - y) = \\ & 9x^2 - y^2(\text{cm}^2) \quad \ddot{\text{i}} \text{ } \ddot{\text{e}} \text{ } \ddot{\text{x}}. \end{aligned}$$

해설

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

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

17. $\left(\frac{xy^b}{x^a y^3} \right)^3 = \frac{y^9}{x^3}$ ì ì $a + b$ ì $\hat{\text{e}}^\circ$ ì $\hat{\text{e}}\text{pl}\neg\text{i}$ ì $\neg\ddot{\text{e}}$ ¼.

[배점 4, 중중]

▶ 정답 : 8

19. $\begin{array}{l} \text{ì } \ddot{\text{e}} \text{ } \ddot{\text{o}} \text{ } \ddot{\text{e}} \text{ } \ddot{\text{o}} \text{í } \ddot{\text{i}} \text{ } A \text{ } \ddot{\text{i}} \text{ } \ddot{\text{i}} \text{ } -x - 2y + 4 \text{ } \ddot{\text{e}} \text{ } \text{Y} \frac{1}{4} \text{ } \ddot{\text{e}} \text{ } \ddot{\text{i}} \text{ } \ddot{\text{i}} \text{ } \ddot{\text{e}} \text{ } \ddot{\text{e}} \\ 4x + y - 3 \text{ } \ddot{\text{e}} \text{ } \ddot{\text{i}} \text{ } \ddot{\text{e}} \text{ } \ddot{\text{o}} \text{. } \ddot{\text{e}} \text{ } \ddot{\text{o}} \text{í } \ddot{\text{i}} \text{ } A \text{ } \ddot{\text{e}} \end{array}$

[배점 4, 중중]

- ① $-x + 2y - 7$ ② $-x + 3y - 3$
③ $5x - 2y + 4$ ④ $5x + 3y - 7$
⑤ $5x + 3y + 7$

해설

$$\begin{aligned} \left(\frac{xy^b}{x^a y^3} \right)^3 &= \frac{x^3 y^{3b}}{x^{3a} y^9} = \frac{y^9}{x^3} \\ 3a &= 6 \quad \therefore a = 2 \\ 3b &= 18 \quad \therefore b = 6 \\ \therefore a + b &= 8 \end{aligned}$$

해설

$$\begin{aligned}
 A + (-x - 2y + 4) &= 4x + y - 3 \text{ ist falsch} \\
 A &= (4x + y - 3) - (-x - 2y + 4) \\
 &= 4x + y - 3 + x + 2y - 4 \\
 &= 5x + 3y - 7
 \end{aligned}$$

18. $\left(\frac{1}{3}\right)^{2x-1} = 27^{x+2}$ 를 풀 때, x 는

四

▶ 정답 : -1

20. $\int x^2 - x + 1 \, dx$ $\rightarrow \frac{1}{4}x^4 + C$

$$\int x^2 - x + 1 \, dx = \frac{1}{4}x^4 + C$$

[배점 4, 중증]

[배점 4, 중중]

- ① $x^2 + x + 1$ ② $x^2 - 2x$
③ $3x^2 - 2x + 1$ ④ $3x^2 + 2$
⑤ $-3x^2 - 3x + 1$

해설

$$\begin{aligned}
 & \circ A^{1/4} \odot \\
 A - (2x^2 - x + 1) &= -x^2 + 2x \\
 A = (-x^2 + 2x) + (2x^2 - x + 1) &= x^2 + x + 1 \\
 \therefore (x^2 + x + 1) + (2x^2 - x + 1) & \\
 &= 3x^2 + 2
 \end{aligned}$$

四

▶ 정답 : 1

해설

$$(ix - i) = 3x^2 - 3xy - 2x^2 + 4xy = x^2 + xy$$

$\therefore \text{The answer is } x^2 + xy.$

- 22.** $5^a \times 9 = 225$, $3 \times 2^b = 192$ ì ¼ è, $a \times b$ ë ¼
 êmuí i -e ¼. [배점 5, 중상]

四

▶ 정답 : 12

해설

$$\begin{aligned} 225 &= 5^a \times 3^2 \\ 192 &= 3 \times 2^6 \\ \therefore a &= 2, b = 6 \end{aligned}$$

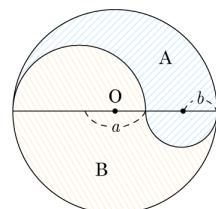
- 23.** \ddot{e} \ddot{e} \ddot{o} \ddot{i} \ddot{A}, B \ddot{i} \ddot{e} \ddot{i} $\ddot{i} \neg A * B = A - 2B$ \ddot{e} $\ddot{\text{Y}}\frac{1}{4}$ \ddot{i} \ddot{i}
 \ddot{i} \ddot{i} . $A = x^2 - 4x + 2$, $B = x^2 + 3x - 5$ \ddot{i} \ddot{e} \ddot{i} $\ddot{i} \neg$
 $(A * B) * B$ \ddot{e} $\ddot{\text{Y}}\frac{1}{4}$ \ddot{e}° \ddot{e}° \ddot{i} \ddot{i} $\ddot{e}\odot'$? [배점 5, 중상]

- ① $-3x^2 - 16x - 22$ ② $\cancel{-3x^2 - 16x + 22}$
③ $2x^2 - 14x + 21$ ④ $2x^2 - 15x + 22$
⑤ $3x^2 + 14x + 22$

해설

$$\begin{aligned}
 (A * B) * B &= (A - 2B) - 2B = A - 4B \quad \text{à l'égalité} \\
 (x^2 - 4x + 2) - 4(x^2 + 3x - 5) &= x^2 - 4x + 2 - 4x^2 - 12x + 20 \\
 &= -3x^2 - 16x + 22
 \end{aligned}$$

- 24.** ê · ,
 ê^{1/4}ê^{3/4} ê° ì ' ë° i§ ê¹ i ê¹, ì ' ê° a , b ì ,
 ê° ì i $\frac{1}{4}$ ê¹ í ° ì O êY^{1/4} A , B è è¶ è¶ ì $\frac{1}{4}$ ê¹
 è è ì è x. ì ' è , A , B ì è ì ' ì ° è ?



[배점 5, 중상]

- ① $\pi(a+b)(a+b)$ ② $\pi(a-b)(a-b)$
③ $\pi(b-a)(b-a)$ ④ $\pi(a+b)(a-b)$
⑤ $\pi(a+b)(b-a)$

해설

$$\begin{aligned}
 & (A \text{의 } \hat{e} \text{ } \hat{i} \text{ } \hat{e}^3) \\
 &= \pi \left(\frac{2a+2b}{2} \right)^2 \times \frac{1}{2} - \pi a^2 \times \frac{1}{2} + \pi b^2 \times \frac{1}{2} \\
 &= \frac{\pi}{2} \{ (a+b)^2 - a^2 + b^2 \} \\
 &= \frac{\pi}{2} (2ab + 2b^2) \\
 &= \pi(ab + b^2) \\
 & (B \text{의 } \hat{e} \text{ } \hat{i} \text{ } \hat{e}^3) \\
 &= \pi \left(\frac{2a+2b}{2} \right)^2 \times \frac{1}{2} + \pi a^2 \times \frac{1}{2} - \pi b^2 \times \frac{1}{2} \\
 &= \frac{\pi}{2} \{ (a+b)^2 + a^2 - b^2 \} \\
 &= \frac{\pi}{2} (2ab + 2a^2) \\
 &= \pi(ab + a^2) \\
 &\therefore B - A = \pi(ab + a^2) - \pi(ab + b^2) \\
 &= \pi(a^2 - b^2) = \pi(a-b)(a+b)
 \end{aligned}$$

25. $(2x-y+1)^2$ 은 \hat{e}^3 의 A , x 의 \hat{e}^3 은 B 이다. $A+B$ 의 \hat{e}^0 은 -4 이다.
 [배점 5, 중상]

▶ 답:

▷ 정답: 0

해설

$$\begin{aligned}
 & (2x-y+1)(2x-y+1) \\
 &= 4x^2 - 2xy + 2x - 2xy + y^2 - y + 2x - y + 1 \\
 &= 4x^2 - 4xy + y^2 + 4x - 2y + 1 \\
 & xy \text{의 } \hat{e}^3 \text{은 } -4, x \text{의 } \hat{e}^3 \text{은 } 4 \text{이므로}. \\
 & \text{따라서 } A = -4, B = 4 \text{이다.} \\
 & A + B = 0
 \end{aligned}$$