

2. When simplified, the expression $-\left[(3x^3 + x - 5) - (x^2 - x - 5x^3)\right] + (3x^2 - 5x + 8x^3)$ is
- a monomial of degree 2
 - a binomial of degree 3
 - a trinomial of degree 2
 - a constant
 - not a polynomial
3. The expression $3y^3(y^3 - 4y + 3) + (2y^3 - 4y^2)(2y^3 + 4y^2)$ is equal to
- $7y^6 - 28y^4 + 9y^3$
 - $7y^9 - 16y^4 - 3y^3$
 - $7y^6 - 16y^4$
 - $3y^6 - 28y^4 + 13y^3$
 - $7y^9 - 8y^5 - 28y^4 + 9y^3$
4. $A = (x - 2y)^3$ and $B = (2x + y)^3$, then $A - B$ is equal to
- $(-x - 3y)^3$
 - $-7x^3 - 18x^2y + 6xy^2 - 9y^3$
 - $-7x^3 - 6x^2y + 18xy^2 - 7y^3$
 - $-7x^3 + 12x^2y - 6xy^2 - 9y^3$
 - $-7x^3 + 6x^2y + 6xy^2 - 9y^3$
5. The expression $a^x(a^x - 4)(a^x + 1) - (a^x - 1)^3$ is equal to
- $1 - 7a^x$
 - $1 - a^x$
 - $1 - 4a^x - 3a^{2x}$
 - $1 - 4a^x$
 - $2a^{3x} - 6a^{2x} - 7a^x + 1$
6. The expression $(3p - 4q)(4q - 3p)$ is equal to
- $16q^2 - 9p^2$
 - $-(3p - 4q)^2$
 - $-(9p^2 + 16q^2)$
 - $-(3p + 4q)^2$
 - $9p^2 - 16q^2$
7. The expression $(3^x - 5^y)^2$ is equal to
- $3^{x^2} - 2 \cdot 3^x 5^y + 5^{y^2}$
 - $3^{2x} - 2 \cdot 30^{x+y} + 5^{2y}$
 - $3^{x^2} - 2 \cdot 30^{x+y} + 5^{y^2}$
 - $3^{2x} - 2 \cdot 3^x 5^y + 5^{2y}$
 - $3^{2x} - 5^{2y}$

8. The expression $(3x^2 - 2)^3$ is equal to:
- $27x^6 - 8$
 - $27x^6 + 54x^4 + 36x^2 + 8$
 - $27x^6 - 54x^4 + 36x^2 - 8$
 - $(3x^2 - 2)(9x^4 - 6x^2 + 4)$
 - $(3x^2 - 2)(9x^4 + 12x^2 + 4)$
9. The coefficient of x^3 in the product $(x - 1)^2(3x + 1)^3$ is
- 54
 - 18
 - 27
 - 27
 - 9
10. If the coefficient of x^3 in the product $(x^4 + x^3 - kx^2 + x - 5)(3x^2 - 4x + k)$ is 18, then k is equal to
- 2
 - 2
 - 1
 - 5
 - 3
11. The coefficient of k^2z^5 in the product $(5k - 2z^5)^3$ is
- 125
 - 60
 - 8
 - 150
 - 75
12. The sum of the coefficients of x^3 and x^2 in the product $(x^2 - 2x + p)(x^2 + kx - 2)$ is -3 , then $p - k$ is equal to
- 3
 - 1
 - 4
 - 1
 - 9
13. The coefficient of a^{2x} in the product $(a^x - 2)^3(a^x + 1)^2$ is
- 22
 - 0
 - 10
 - 18
 - 8
14. If $\frac{1}{x} + x = 3$, then by using the expansion of $(x + \frac{1}{x})^3$, the value of $x^3 + \frac{1}{x^3}$ is equal to
- 27
 - 18
 - 3
 - 0
 - 36
15. Let $P(x) = 3x^4 - 6x^2 + 2x^5 + 7x^3 - x + 10$. Then only one of the following is TRUE :
- $P(x) + \frac{1}{x}$ is a polynomial
 - The degree of $P(x)$ is 6.
 - There are 5 terms in $P(x)$.
 - $P(x)$ is in simplest form.
 - The leading coefficient of $P(x)$ is equal to 2.

3. FACTORING POLYNOMIALS

1. A factorization of $-6m^4 + 41m^3 + 7m^2$ is equal to
- $-m^2(6m + 1)^2$
 - $m(3m + 1)(2m - 7)$
 - $-m(6m^2 + 1)(m - 7)$
 - $m^2(6m - 1)(m - 7)$
 - $-m^2(6m + 1)(m - 7)$
2. Factoring $-5a^4b - 5a^3b^2 + 30a^2b^3$ gives
- $5a^2b(a + 3b)(2b - a)$
 - $-5a^2b(a - 3b)(a + 2b)$
 - $-5(a^3 - 2b^2)(a + b)$
 - $-(6b - a)(a^2b^2 + 5b)$
 - $-5a^2b(a + b)^2$
3. A factorization of $x^2y^2 - 1 - 2xyz + z^2$ is equal to
- $(x + y + z - 1)(x + y + z + 1)$
 - $(xyz - 1)(xyz + 1)$
 - $(xy + z - 1)(xy + z + 1)$
 - $(x + y + 1 - z)(x + y + 1 + z)$
 - $(xy - z - 1)(xy - z + 1)$
4. Factoring $3ab^2 + 9a - 2ab^3 - 6ab$ gives
- $(3a - 2b)(b^2 + 3)$
 - $a(3 + 2b^2)(b - 3)$
 - $a(3 - 2b^2)(b + 3)$
 - $a(3 - 2b)(b^2 + 3)$
 - $a(3 + 2b)(b^2 - 3)$
5. A factorization of $10x^3y - 15xy^3 + 25x^2y^2$ is equal to

- (a) $5xy(2x + y)(x - 3y)$
 (b) $10xy(x - y)(x + 3y)$
 (c) $5xy(2x - y)(x + 3y)$
 (d) $5xy(x - y)(2x + 3y)$
 (e) $5(2x^2 - y^3)(x + 3y)$
6. One factor of $3x^2 + xy - 2y^2 - x - y$ is equal to
 (a) $3x - 2y + 1$
 (b) $-3x - 2y - 1$
 (c) $3x + 2y - 1$
 (d) $3x + 2y + 1$
 (e) $3x - 2y - 1$
7. Factoring $6x^2y^3 + 18xy + 3x^2y^2 + 9x$ gives
 (a) $3x(2y + 1)(xy^2 + 3)$
 (b) $3x(2x + y)(y^2 + 3)$
 (c) $3x(2y + x)(x + 3)$
 (d) $3x(3y + 1)(xy^2 + 3)$
 (e) $3x(y + 1)(2xy^2 + 3)$
8. One factor of $6(4x^2 - 12xy + 9y^2) + 7(2x - 3y) - 3$ is equal to
 (a) $4x + 6y - 1$
 (b) $6x - 9y - 1$
 (c) $6x - 9y + 3$
 (d) $4x - 6y - 1$
 (e) $6x - 9y - 3$
9. When factoring $x^2y - xy^2 + x^3 - y^3$, we get
 (a) $(x - y)^2(x + y)$
 (b) $(x - y)(x + y)^2$
 (c) $(x - y)(x^2 + y^2 + xy)$
 (d) $(x - y)(x^2 + y^2)$
 (e) $(x - y)(x + y + 3xy)$
10. When factoring $6x^2 - 2y^2 - xy - 6x + 4y$, we get
 (a) $(3x + 2y)(2x - y + 2)$
 (b) $(3x + 2y)(2x + y + 2)$
 (c) $(3x - 2y)(2x - y + 2)$
 (d) $(3x - 2y)(2x + y - 2)$
 (e) $(3x - 2y)(3x + y + 2)$
11. When factoring $a^2 + 2ab + b^2 - x^2 - 2xy - y^2$, we get
 (a) $(a + b - x + y)(a + b + x + y)$
 (b) $(a - b - x - y)(a + b + x + y)$
 (c) $(a + b - x - y)(a + b + x + y)$
 (d) $(a - b + x - y)(a + b + x + y)$
 (e) $(a + b - x - y)^2$
12. By completing the square, the expression $m^4 + m^2n^2 + 25n^4$ gives
 (a) $(m^2 + 5n^2)^2$
 (b) $(m^2 - 3mn + 5n^2)(m^2 + 3mn + 5n^2)$
 (c) $(m^2 - 3mn + 5n^2)^2$
 (d) $(m^2 + 3mn - 5n^2)(m^2 - 3mn - 5n^2)$
 (e) $(m + 5n)(m - n)(m - 5n)(m + n)$
13. If the expression $x^4 + 9x^2 + 81$ is completely factored, the result is
 (a) $(x^2 - 9 + 3x)(x^2 + 9 - 3x)$
 (b) $(x^2 + 9 + 3x)(x^2 + 9 - 3x)$
 (c) $(x^2 - 9 - 3x)(x^2 + 9 - 3x)$
 (d) $(x^2 + 9 + 3x)(x^2 - 9 - 3x)$
 (e) $(x^2 + 9)^2$
14. One factor of $m^4 + m^2 + 25$ is equal to
 (a) $m^2 + 5$
 (b) $m^2 - m + 5$
 (c) $m^2 - 5$
 (d) $m^2 + m + 5$
 (e) $m^2 - 3m + 5$
15. Factoring $4y^4 - 5y^2 + 1$ gives
 (a) $(2y - 1)(2y + 1)(y - 1)(y + 1)$
 (b) $(1 - 2y)(1 + y)(y - 1)(y + 2)$
 (c) $(2y - 1)^2(y - 1)^2$
 (d) $(4y + 1)(y - 1)$
 (e) $(2y^2 - 1)^2$
16. If the expression $x^4 + 324$ is completely factored, the result is
 (a) $(x^2 - 6x + 18)(x^2 + 6x + 18)$
 (b) $(x^2 + 3x - 18)(x^2 + 3x + 18)$
 (c) $(x^2 + 18x - 18)(x^2 + 18x + 18)$
 (d) $(x^2 + 9x - 18)(x^2 + 9x + 18)$
 (e) $(x^2 + 18)^2$
17. One factor of $w^4 + 4v^4$ is
 (a) $(w^2 - 4wv + v^2)$
 (b) $(w^2 + 3wv - 1)$
 (c) $(2v^2 + w^2)$
 (d) $(w + 2v)$
 (e) $(w^2 + 2v^2 - 2wv)$
18. When factoring $x^4 - 82x^2 + 81$, we get
 (a) $(x^2 - 5x + 3)(x^2 + 5x + 27)$
 (b) $(x^2 + 5x - 3)(x^2 - 5x - 27)$

- (c) $(x^2 + 10x - 9)(x^2 - 10x - 9)$
 (d) $(x^2 - 5x + 9)(x^2 + 5x + 9)$
 (e) $(x^2 - 10x + 9)(x^2 + 10x + 9)$
19. When factoring $3x^4 + 12x^2 + 48$, we get
 (a) $3(x^2 + 4 - 2x)(x^2 + 4 + 2x)$
 (b) $3(x^2 - 4 + 2x)(x^2 + 4 - 2x)$
 (c) $6(x^2 + 4 - 2x)^2$
 (d) $6(x^2 - 4 + 2x)^2$
 (e) $6(x^2 + 4x - 2)(x^2 + 4x + 2)$
20. A factorization of $2x^{2n} - 23x^n y^n - 39y^{2n}$ is
 (a) $(x^n + 3y^n)(2x^n - 13y^n)$
 (b) $(2x^n - 3y^n)(x^n + 13y^n)$
 (c) $(2x^n + 3y^n)(x^n - 13y^n)$
 (d) $(x^n - y^n)^2$
 (e) $2(x^n - y^n)(x^n + y^n)$
21. When factoring $6(m+n)^{2k} + (m+n)^k - 15$, we get
 (a) $[2(m+n)^k + 3][3(m+n)^k - 5]$
 (b) $[2(m+n)^k - 3]^2$
 (c) $[2(m+n)^k - 3][3(m+n)^k + 5]$
 (d) $[3(m+n)^k + 5]^2$
 (e) $[3(m+n)^k - 3][2(m+n)^k + 5]$
22. One factor of $27x^6 - (x-y)^3$ is
 (a) $3x^2 + x + y$
 (b) $3x^2 - x + y$
 (c) $3x^2 - x - y$
 (d) $x^2 - 3x + y$
 (e) $x^2 + 3x + y$
23. One factor of $(x^2 + y^2)^3 - 8x^3 y^3$ is
 (a) $y - x$
 (b) $x + y$
 (c) $x^2 + y^2$
 (d) $x^2 + y$
 (e) $y + x^2$
24. Factoring $y^6 - 4y^4 - 25y^2 + 100$ gives
 (a) $(y^2 + 5)^2(y - 2)^2$
 (b) $(y - 5)(y + 5)(y^2 - 2)(y^2 + 2)$
 (c) $(y^2 - 5)(y - 2)(y + 2)^3$
 (d) $(y^2 - 5)(y^2 + 5)(y - 2)(y + 2)$
 (e) $(y^2 - 5)^4(y - 2)$
25. Factoring $(x - y - 2z)^2 - (2x + y - z)^2$ gives
 (a) $-3(x + z)(x + z + 2y)$
 (b) $3(x - z)(x - z + 2y)$
 (c) $(3x - z)(x + z - 2y)$
 (d) $(x - 3z)(x + z + 2y)$
 (e) $-3(x - z)(x + z + 2y)$
26. Factoring $x^3 y^3 - 1 + x^3 - y^3$ gives
 (a) $(x + 1)(y - 1)(x^2 - x + 1)(y^2 + y + 1)$
 (b) $(x^3 + x + 1)(y^3 - y^2 + 1)$
 (c) $(x - 1)(y + 1)(x^2 + x + 1)(y^2 - y + 1)$
 (d) $(x - 1)(y - 1)(x^2 - x + 1)(y^2 - y + 1)$
 (e) $(x - 1)^2(y + 1)^2(x + 1)(y - 1)$
27. If we factor $P(x) = 2x^4 - 5x^3 + 4x^2 - 5x + 2$ completely in \mathfrak{R} , we get
 (a) three linear factors
 (b) one prime and two linear factors
 (c) four linear factors
 (d) two prime factors
 (e) $P(x)$ is a prime factor
28. The expression $(p^{4n} - 1)$ factors into $p^{4n} - 1 = (p^n - 1)x$, then x equals
 (a) $(p^n + 1)(p^{2n} + 1)$
 (b) $p^{3n} + 1$
 (c) $p^{2n} + 1$
 (d) $(p^n - 1)(p^{2n} + 1)$
 (e) $(p^n + 1)(p^n - 1)$

4. RATIONAL EXPRESSIONS

1. The expression $\left(1 - \frac{4xy}{x^2 + 2xy + y^2}\right) \div \left(1 + \frac{4xy}{x^2 - 2xy + y^2}\right)$ simplifies to
 (a) 1
 (b) $x - y$
 (c) $\left(\frac{x-y}{x+y}\right)^4$
 (d) $x + y$
 (e) $\left(\frac{x+y}{x-y}\right)^4$
2. The expression $\frac{x^2 y^{-2} - y^2 x^{-2}}{yx^{-1} + xy^{-1}}$ simplifies to
 (a) $\frac{x^6 - y^6}{x^3 y^3}$
 (b) $\frac{x^4 - y^4}{xy}$
 (c) $\frac{x^2 - y^2}{x^2 + y^2}$
 (d) $\frac{x+y}{xy}$

(e) $\frac{(x+y)(x-y)}{xy}$

3. The expression $\frac{2 - \frac{2}{x}}{2 + \frac{2}{x}}$ simplifies to

- (a) -1
 (b) $\frac{x+2}{3x-2}$
 (c) $\frac{x-2}{2-3x}$
 (d) $\frac{x-2}{3x-2}$
 (e) 1

4. The expression $\frac{x^{-1} - y^{-1} + 1}{1 + (y-x)^{-1}xy}$ simplifies to

- (a) $\frac{xy}{y-x}$
 (b) $\frac{y-x}{xy}$
 (c) 1
 (d) $\frac{x+y}{xy}$
 (e) $\frac{xy}{2y-x}$

5. The expression $1 - \frac{1 - \frac{1}{x}}{x^2 - \frac{1}{x^2}}$ simplifies to

- (a) $\frac{x^2}{x+1}$
 (b) $\frac{x^2+1}{x^2}$
 (c) $\frac{x^2}{x^2+1}$
 (d) $\frac{x+1}{x}$
 (e) $\frac{x}{x+1}$

6. The expression $\frac{1 - \frac{1}{x}}{1 - \frac{1}{x+1}}$ simplifies to

- (a) $\frac{(x+1)^2}{x}$
 (b) 1
 (c) $\frac{1}{(x+1)^2}$
 (d) $\frac{x}{(x+1)^2}$
 (e) $\frac{1}{x}$

7. The expression $\left[a^{-1} - \frac{1}{a-1} - \frac{a+1}{a} \right]^{-1}$ simplifies to

- (a) $\frac{a}{a+1}$
 (b) $\frac{1-a}{a}$
 (c) $\frac{a+1}{a}$
 (d) $\frac{a}{1-a}$
 (e) $2a$

8. The expression $\frac{r^{-1} + q^{-1}}{r^{-1} - q^{-1}} \cdot \frac{r-q}{r+q}$ simplifies to

- (a) $\left(\frac{r-q}{r+q} \right)^2$
 (b) -1
 (c) $\left(\frac{r+q}{r-q} \right)^2$
 (d) 1
 (e) $\frac{r^2 - q^2}{r^2 + q^2}$

9. The expression $\frac{8y^3 - 125}{4y^2 - 20y + 25} \div \frac{4y^2 + 10y + 25}{2y - 5}$ simplifies to

- (a) $(2y + 5)^2$
 (b) $\frac{1}{(2y+5)^2}$
 (c) $(4y^2 + 10y + 25)^2$
 (d) $\frac{1}{(4y^2 + 10y + 25)^2}$
 (e) 1

10. The expression $\left[\frac{1}{x} - \frac{1}{x-2} + \frac{1}{x^2-2x} \right] \div \left[\frac{x}{x-2} + \frac{3}{x} \right]$ simplifies to

- (a) $\frac{-1}{x^2+3x-6}$
 (b) $\frac{2x-3}{x^2+3x-6}$
 (c) $\frac{x+2}{x^2-2x}$
 (d) $\frac{-2}{x+1}$
 (e) $\frac{-4x+2}{x+1}$

11. The expression $(x^{-2} - y^{-2})(x+y)^{-1}xy$ simplifies to

- (a) $\frac{x-y}{xy}$
 (b) $\frac{xy}{x-y}$
 (c) $\frac{xy}{x+y}$
 (d) $\frac{y-x}{xy}$
 (e) $\frac{x+y}{xy}$

12. The expression $\left(\frac{9y^2 + 2x^2}{x^3 + 27y^3} - \frac{x}{x^2 - 3xy + 9y^2} \right) \div (x^2 - 9y^2)^{-1}$ simplifies to

- (a) $3x + y$
 (b) $y - 3x$
 (c) $-x - 3y$
 (d) $3y + x$
 (e) $x - 3y$

13. The expression $\frac{a^3 + 2a^2 - a - 2}{x^2 + 3x + 2} - \frac{x^2 - 2x + 1}{x+1}$ simplifies to

- (a) $\frac{2(x-1)}{x+1}$
 (b) $\frac{2}{x+1}$
 (c) $\frac{2x+3}{(x+2)(x-1)}$
 (d) 0
 (e) $-(x-1)^2$

14. The expression $\left[\frac{-b^2 + a^2}{ab^3 - a^3b} \right]^{-1} (a^{-1} + b^{-1})$ simplifies to

- (a) $ab(a+b)$
 (b) $-a+b$
 (c) $-a-b$
 (d) $\frac{1}{a} + \frac{1}{b}$
 (e) $\frac{ab}{a+b}$

15. The expression $(1 + x^{a-b})^{-1} + (1 + x^{b-a})^{-1}$ simplifies to

- (a) x^{2a}
- (b) x^{-2b}
- (c) 2
- (d) $x^{2a} + x^{-2b}$
- (e) 1

simplifies to

- (a) $x^3y(x^2 + y^2)$
- (b) $(x^2 + y^2)^2$
- (c) $\frac{x^3y}{x^{-2} + y^{-2}}$
- (d) $x^2y^3(x^2 + y^2)$
- (e) $(x^2y)^{-1}(x^2 + y^2)$

16. The expression $2 + \frac{1}{2 + \frac{1}{1 + \frac{1}{x}}}$ simplifies to

- (a) $\frac{x+2}{x+1}$
- (b) $\frac{5x+4}{x+1}$
- (c) $\frac{7x+2}{x+1}$
- (d) $\frac{2x+10}{x+4}$
- (e) $\frac{7x+5}{3x+2}$

22. The expression $\frac{x^2-3x+2}{x^2+x-6} \div \frac{x^3+x^2-2x}{x^2+5x+6}$ simplifies to

- (a) $\frac{(x-1)(x+3)}{x(x+1)(x-3)}$
- (b) $\frac{x-1}{x(x+1)}$
- (c) $\frac{(x-2)^2}{x(x+2)^2}$
- (d) $\frac{(x+3)}{x(x-3)}$
- (e) $\frac{1}{x}$

17. The expression $\left(\frac{y^3+4y^2-5y}{y^2-2y+1} \div \frac{y^2+y-2}{y^4+8y}\right) \cdot \frac{y-1}{y^2-2y+4}$ simplifies to

- (a) $\frac{y+5}{y-1}$
- (b) $\frac{y^2}{y-1}$
- (c) $\frac{y^2(y+5)}{y-1}$
- (d) $\frac{y+5}{y+2}$
- (e) $\frac{y^2}{y+2}$

23. The expression $\frac{\frac{5}{5-\frac{5}{x}} - 5}{5 + \frac{5}{5-\frac{5}{x}}}$ simplifies to

- (a) $\frac{4x-5}{6x-5}$
- (b) $\frac{5-4x}{6x-5}$
- (c) $\frac{5-4x}{6x+5}$
- (d) $\frac{5+4x}{6x-5}$
- (e) $\frac{5+4x}{6x+5}$

18. The expression $\frac{x^{-3}-y^{-3}}{x^{-1}-y^{-1}}$ simplifies to

- (a) $x^{-2} - y^{-2}$
- (b) $\frac{x^2+xy+y^2}{x^2y^2}$
- (c) $(x^{-1} - y^{-1})^2$
- (d) $\frac{x^2-xy+y^2}{x^2y^2}$
- (e) $x^2 + xy + y^2$

24. The expression $\frac{3}{x^2+xy-2y^2} + \frac{2}{y^2-x^2}$ simplifies to

- (a) $\frac{2x+5y}{(x-2y)(x^2-y^2)}$
- (b) $\frac{1}{(x-2y)(x+y)}$
- (c) $\frac{1}{(x+2y)(x+y)}$
- (d) $\frac{5x+7y}{(x+2y)(x^2-y^2)}$
- (e) $\frac{x+y}{(x-2y)(x-y)^2}$

19. The expression $\frac{(-4x^3y^{-2})^{-2}}{(4x^5y^4)^{-1}}$ simplifies to

- (a) $\frac{y^8}{4x}$
- (b) $\frac{4x}{y^8}$
- (c) $-x^2y^6$
- (d) $\frac{4}{x}$
- (e) $\frac{5y^8}{16x}$

25. The expression $\frac{4}{2b^2-6b+4} - \frac{2}{b^2-b-2}$ simplifies to

- (a) $\frac{4}{(b-2)(b-1)^2}$
- (b) $\frac{4}{(b-2)(b+1)^2}$
- (c) $\frac{-4b}{(b-2)(b-1)^2}$
- (d) $\frac{-4b}{(b-2)(b^2-1)}$
- (e) $\frac{4}{(b-2)(b^2-1)}$

20. The expression $\frac{3}{a^2+5a-6} - \frac{3}{a^2+7a+6}$ simplifies to

- (a) $\frac{6}{(a-6)(a^2+1)}$
- (b) $\frac{6}{(a+6)(a^2+1)}$
- (c) $\frac{6}{(a-6)(a^2-1)}$
- (d) $\frac{6}{(a+6)(a^2-1)}$
- (e) $\frac{-6}{(a-6)(a^2+1)}$

26. The expression $\left(\frac{x^3-1}{x^2+x+1} - \frac{x^2-1}{x-1}\right) \div \frac{x-2}{-x^2+5x-6}$ simplifies to

- (a) $6 - 2x$
- (b) $x - 3$
- (c) 0
- (d) $2x - 6$
- (e) $3 - x$

21. The expression $(x^2y)^{-1}(x^2 + y^2)^3(x^{-2} + y^{-2})^{-2}$

27. The expression $\frac{(a+b+c)^2 - (b-c)^2}{a+2c}$ simplifies to

- (a) $2a - b$
 (b) $a - 2b$
 (c) $a + 2b$
 (d) $a + b$
 (e) $a + b - c$
28. The expression $\frac{1}{x^2+x-12} - \frac{1}{x^2-7x+12} + \frac{1}{x^2-16}$ simplifies to
 (a) $\frac{x-3}{(x-3)(x-4)(x+4)}$
 (b) $\frac{x-11}{(x+3)(x-4)(x+4)}$
 (c) $\frac{x+3}{(x-3)(x+4)^2}$
 (d) $\frac{x-11}{(x-3)(x+4)(x-4)}$
 (e) $\frac{11-x}{(x-3)(x+4)(x-4)}$
29. The expression $\frac{3x^2-3x-1}{2x^2-3x-2} + \frac{1}{2-x}$ simplifies to
 (a) $\frac{3(x-1)}{2(x-2)}$
 (b) $\frac{8-3x}{2(2-x)}$
 (c) $\frac{3x-1}{2x+1}$
 (d) $\frac{-3x^2+12x-13}{(2x-5)(2-x)}$
 (e) $\frac{3x+1}{2x+1}$
30. The expression $\left[\frac{6}{x} - \frac{1}{x^2} - \frac{2}{x^3}\right] \div \left[3 - \frac{14}{x} + \frac{8}{x^2}\right]$ simplifies to
 (a) $\frac{x+4}{x(2x+1)}$
 (b) $\frac{x(x-4)}{2x+1}$
 (c) $\frac{1}{x}$
 (d) $\frac{2x+1}{x(x-4)}$
 (e) $\frac{2x+1}{x(x+4)}$
31. The expression $\left[\left(\frac{a}{b} - \frac{b}{a}\right) \div \left(\frac{1}{a} - \frac{1}{b}\right)\right] (a + b)$ simplifies to
 (a) $\frac{a}{b}$
 (b) $\frac{b+a}{a-b}$
 (c) $-(a + b)^2$
 (d) a
 (e) $-b$
32. The expression $(y^{-2} - x^{-2})^{-3n} (x^2 - y^2)^{2n} (x^2 y^2)^{-3n}$ simplifies to
 (a) $(x^2 - y^2)^{-n}$
 (b) $(x^2 + y^2)^n$
 (c) $\frac{x^2 - y^2}{x^2 + y^2}$
 (d) $x^n y^n$
 (e) $(x^2 y)^{-n} (x^2 + y^2)$
33. The expression $\frac{27(3m^{-2})^{-2}(3m^{-2})^{-5}}{(5m^2n^{-3})^0 m^4}$ simplifies to
 (a) $\frac{81}{m^{10}}$
 (b) $\frac{m^{10}}{3}$
 (c) $\frac{m}{27}$
 (d) $\frac{m^{10}}{81}$
 (e) mn^3
34. The expression $\left[\frac{x}{x^2+x-2} - \frac{5}{3(x^2+3x-4)} - \frac{7}{3(x^2+6x+8)}\right] \div \left(\frac{x+1}{x+4}\right)$ simplifies to
 (a) $\frac{1}{x+1}$
 (b) $\frac{1}{x+2}$
 (c) $x - 2$
 (d) $x + 2$
 (e) $x + 1$
35. The expression $\frac{a^3+b^3}{a^3-b^3} \div \frac{a^2+2ab+b^2}{a^2-b^2}$ simplifies to
 (a) $\frac{a-b}{a+b}$
 (b) $\frac{a+b}{a-b}$
 (c) $\frac{a^2-ab+b^2}{a^2+ab+b^2}$
 (d) $a^2 - ab + b^2$
 (e) $(a - b)^2$