



MATHS

BOOKS - PEARSON IIT JEE FOUNDATION

POLYNOMIALS, LCM AND HCF OF POLYNOMIALS

Example 4 1

1. Find the product of $(a + b + c) [(a - b)^2 + (b - c)^2 + (c - a)^2]$

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Example 4 2

1. Factorize $a^3 + (b - a)^3 - b^3$.



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Example 4 3

1. If $abc = 8$ and $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = \frac{3}{2}$, then find the value of $ab + bc + ac$.

A. 10

B. 11

C. 12

D. 13

Answer: C



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Example 4 4

1. The HCF of the polynomials $(x - 2)(2x^2 + x + a)$ and $(2x - 1)(x^2 - 5x + b)$ is $(x - 2)(2x - 1)$. Find the relation between a and b.

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Example 4 5

1. If $f(x) = (x^2 + 3x + a)$, $g(x) = (x^2 + 5x + b)$, $h(x) = (x^2 + 4x + c)$ and LCM of $[f(x), g(x)$ and $h(x)]$ is $(x + 1)(x + 2)(x + 3)$, then find $(a - b + c)$.

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Test Your Concepts Very Short Answer Type Questions

1. The degree of the polynomial $9x^4 - 7x^2 + 8x^3$ is _____.

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2. The numerical coefficient of the term $17x^2$ is _____.

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3. The algebraic identity that can be used in evaluating the value of $(98)^2$ is _____.

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4.
$$\frac{37^3 - 28^3}{37^2 + 37 \cdot 28 + 28^2} =$$

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5. The literal coefficient of the term $\frac{17}{3}x^3$ _____.

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6. The appropriate formula that can be used to find the value of $\left(50\left(\frac{1}{4}\right) \times 49\left(\frac{3}{4}\right)\right)$ is

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7. If $(a - b)^2 + (b - c)^2 + (c - a)^2 = 0$, then the values of a, b, and c are _____.

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8. If $a + \frac{1}{a} = -2$, then $a^2 + \frac{1}{a^2} =$ _____.

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Test Your Concepts Factorise The Following

1. factorise $x^4y - 2x^3y^2$

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2. $\frac{x^3 + 8}{x + 2} = x^2 + 2x + 4$. Is the given statement true?

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3. Simplify: $(-3ab) - (11ab) - (-20ab) - (14ab)$

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4. $(m + n)(m + n)(m + n)(m - n)(m - n)(m - n) = m^6 - n^6$.

(True/False)

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5. Divide $(4x^3 + 2x - 11)$ by $2x^2$.

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6.
$$\frac{a^3 + b^3 - c^3 + 3abc}{a + b - c} =$$

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7. factorise $ax^2y + axy^2 + a^2xy + 2axy$.

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Test Your Concepts Simplify The Following

1. $(x^3 - 2x^2 - 3) \times (-x)$



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2. The HCF of $(x^2 - 1)^2$, $(x + 1)$ and $(x^2 - 1)$ is



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3. factorise $ax - bx + a^2 - ab$



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4. The HCF of $xy + x^2$, $xy - x^2$ and $x^4 - x^2y^2$ is



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5. simplify $(x + 11)^2$

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6. The HCF and LCM of $36x^2y^3$ and $32x^3y^2$ are _____ and _____ respectively.

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7. $(5a + 2b)^3$ simplify

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8. $\left(\frac{x}{4} + \frac{2y}{5}\right)^3$ simplify

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9. The LCM of $27a^5$ and $81a^{10}$ is 3^4a^{10} . If the given statement true?

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10. Find the products of the following by using the appropriate identity:

$$(x - 2)(x + 3)$$

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11. Find the products of the following by using the appropriate identity:

$$(x + 5)(x - 11)$$

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12. Find the products of the following by using the appropriate identity:

$$(x - 9)(x - 7)$$

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13. The HCF of $36xy$ and k is 6, then the least value of k is

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14. The LCM of $(x + a)^2$ and $(x^2 - a^2)$ is _____.

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15. Find the following products using the appropriate identity:

$$(x + 11)(x - 11)$$

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16. Find the following products using the appropriate identity:

$$\left(\frac{x}{3} + \frac{1}{2}\right)\left(\frac{x}{3} - \frac{1}{2}\right)$$

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17. Find the following products using the appropriate identity:

$$(ab + cd)(ab - cd)$$

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18. Find the values of the following by using suitable identity:

$$(55)^2$$

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19. Find the values of the following by using suitable identity:

$$(26)^2$$



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20. Find the values of the following by using suitable identity:

$$105 \times 95$$



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21. Find the values of the following by using suitable identity:

$$52.5 \times 47.5$$



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22. Find the values of the following by using suitable identity:

$$(206)^3$$

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23. Find the values of the following by using suitable identity:

$$(396)^3$$

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24. Factorize

$$x^5y - xy^5$$

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25. Factorize

$$x^2 + 5x - 6$$



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26. $(3x^2 + x - 11) \times (7x^3 + 12)$



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27. Using the factor method, simplify

$$(x^2y + 2xy + x + 2) \div (xy + 1).$$



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28. What must be subtracted from $2x^2 - 1$ in order to get

$$x^3 + x^2 + x + 1?$$



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29. Factorize

$$1 + 6ab + 9a^2b^2$$



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30. Factorize

$$8l^3 - 36l^2m + 54lm^2 - 27m^3$$



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Test Your Concepts Short Answer Type Questions

1. If $A = 5x^3 - 11$,

$B = 9x^3 - 2x^2 + 7$, and

$C = x^2 + 9$, then find

$A + C$.

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2. If $A = 5x^3 - 11$,

$B = 9x^3 - 2x^2 + 7$, and

$C = x^2 + 9$, then find

$A + (B + C)$.

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3. What must be added to $7x^3 - 3x^2 + 5x + 4$ in order to get

$9x^3 + x^2 - x - 1$?

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Test Your Concepts Expand The Following By Using Appropriate Identity

1. $(x + 2y + 3z)^2$



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2. $(3a - 2b + 5c)^2$



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3. Expand the following by using the identity

$$(a - b)^3 = a^3 - b^3 - 3ab(a - b)$$

$$(2x - 3y)^3$$



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4. Expand the following by using the identity

$$(a - b)^3 = a^3 - b^3 - 3ab(a - b)$$

$$\left(\frac{a}{11} - 1\right)^3$$



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5. Find the following products.

$$(cx + by)(cx - by)\left((cx)^2 + (by)^2\right)$$



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6. Find the following products.

$$(a + 1)(a - 1)(a^2 + 1)$$



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7. If $a^2 + b^2 = 40$ and $ab = 12$, find $a + b$ and $a - b$.

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8. Factorize :

$$64a^3 - 1$$

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9. Simplify:

$$(2x + 3y)^2 + (2x - 3y)^2$$

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10. Simplify:

$$(1 - ab)^2 - (1 + ab)^2$$



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11. Simplify:

$$(2a - 3b + 1)^2 + (2a - 3b - 1)^2$$



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12. Simplify:

$$(5x + 3y + 2)^2 + (5x + 3y - 2)^2$$



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13. Simplify:

$$(ax + by)^3 - (ax - by)^3$$



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14. Simplify:

$$(4x + 7)^3 + (4x - 7)^3$$

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15. If $a - b = 5$ and $ab = -4$, then find $a^3 - b^3$.

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16. If $a^2 - 2a - 1 = 0$, then find $a - \frac{1}{a}$, $a + \frac{1}{a}$, $a^2 + \frac{1}{a^2}$ and $a^2 - \frac{1}{a^2}$.

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Test Your Concepts Essay Type Questions

1. If $a^2 + b^2 + c^2 = 24$ and $ab + bc + ca = -4$, then find $a + b + c$.

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2. Find the LCM and the HCF of the polynomials $(x^2 - 1)(x^2 + x - 2)$ and $(x^2 + 2x + 1)(x^2 + 2x - 3)5$. Verify if the product of the L.C.M and the HCF is equal to the product of polynomials.

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3. If $x + y + z = 0$, then find $(x + y)^3 + (y + z)^3 + (z + x)^3$.

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4. If $x + y = 3$ and $xy = 2$, then find $x^4 + y^4$.

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5. If $x - y = 3$ and $xy = 10$, then find $x^4 + y^4$.

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6. If $x^2 + \frac{1}{x^2} = \frac{17}{4}$, then find $x - \frac{1}{x}$, $x + \frac{1}{x}$, $x^3 - \frac{1}{x^3}$ and $x^3 + \frac{1}{x^3}$

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Concept Application Level 1

1. If $a + \frac{1}{a} = 3$, then the value of $a^2 + \frac{1}{a^2}$ is _____.

A. 9

B. 6

C. 7

D. 8

Answer: C



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2. If $a^2 + \frac{1}{a^2} = 27$, then the value of $a - \frac{1}{a}$ is _____.

A. ± 5

B. ± 6

C. ± 7

D. ± 8

Answer: A



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3. The expansion of $(x^2 + 4)(x^2 - 4)(x^4 + 16)$ is _____.

A. $x^8 - 128$

B. $x^4 - 16^2$

C. $x^6 - 256$

D. $x^8 - 256$

Answer: D



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4. If the value of $a^2 + \frac{1}{a^2}$ is 786, then the value of $a - \frac{1}{a}$ is

_____.

A. ± 23

B. ± 25

C. ± 17

D. ± 28

Answer: D



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5. Which of the following is the factor of

$$4a^2 + b^2 - 4ab + 2b - 4a + 1?$$

A. $(a - b)$

B. $(a + b - 2)$

C. $(a - b + 2)$

D. $(2a - b - 1)$

Answer: D



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6. Expand $\left(\frac{x}{3} - \frac{y}{2}\right)^2$

A. $\frac{x^2}{9} + \frac{y^2}{4}$

B. $\frac{x^2}{9} - \frac{y^2}{4}$

C. $\frac{x^2}{9} + \frac{y^2}{4} - \frac{xy}{9}$

D. $\frac{x^2}{9} + \frac{y^2}{4} + \frac{xy}{9}$

Answer: C



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7. Simplest form of $\left(\frac{2a}{5} + \frac{3q}{5}\right)^3 - \left(\frac{2a}{5} - \frac{3q}{5}\right)^3$ is

A. $\frac{1}{125}(54q^3 - 72a^2q)$

B. $\frac{1}{125}(54q^3 + 72a^2q)$

C. $\frac{1}{125}(16q^3 + 108aq^2)$

D. $\frac{1}{125}(16q^3 - 108aq^2)$

Answer: B

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8. Factorize the polynomial $-r^2 + p^2 + q^2 - 2pq$.

A. $(p - q - r)(p - q + r)$

B. $(p + q + r)(p - q - r)$

C. $(p - q)(q - r)$

D. $(p - r)(q - r)$

Answer: A

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9. $\left(a + \frac{1}{a} + 2\right)^2 = 4$ then find $a^2 + \frac{1}{a^2}$ given that $a^2 + \frac{1}{a^2}$ can not be negative

A. 12

B. 13

C. 14

D. -14

Answer: C



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10. The product of the polynomials $(x^2 - x + 2)$ and $(x - 1)$ is _____.

A. $x^3 - 2x^2 + 3x - 2$

B. $x^3 + 3x^2 - 3x + 2$

C. $x^3 - 2x + 4x^2 - 6$

D. $x^3 - 2x^2 + 3x + 2$

Answer: A

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11. Simplify the equation $\left(\frac{a}{2} - \frac{b}{3}\right)^3 + \left(\frac{a}{2} + \frac{b}{3}\right)^3$.

A. $\frac{a^3}{4} + ab^2$

B. $\frac{a^3}{4} + \frac{ab^2}{3}$

C. $\frac{2b^3}{27} + \frac{a^2b}{2}$

D. $\frac{2b^3}{27} + a^2b$

Answer: B

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12. Factorize : $(x - y)^3 + (y - z)^3 + (z - x)^3$

A. $2x^3 + 2y^3 + 2z^3$

B. $(x - y)(y - z)(z - x)$

C. 0

D. $3(x - y)(y - z)(z - x)$

Answer: D



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13. If $x + y = 3$ and $xy = 2$, then find $x^4 + y^4$.

A. 16

B. 14

C. 18

D. 17

Answer: D



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14. The HCF of the polynomials $10(a - 1)(a - 2)^3$, $120(a - 3)(a - 2)^3$, and $135(a + 3)(a - 2)^3$ is _____.

A. $25(a - 3)(a - 2)$

B. $5(a - 3)(a + 2)$

C. $5(a - 2)^3$

D. $5(a - 3)(a - 2)(a + 3)$

Answer: C

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15. The LCM of the polynomials $12(x^4 + x^3 + x^2)$ and $18(x^4 - x)$ is

A. $36x^2(x^3 - 1)$

B. $36x(x^3 - 1)$

C. $36(x^4 + x^3 + x^2)(x^4 - x)$

D. $36(x^4 + x^3 + x^2)(x + 1)$

Answer: A

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16. The polynomials $a^2 - b + ab - a$, on factorization, reduces to _____.

A. $(a + b)(a^2 + b^2)$

B. $(a + b)(a + 1)$

C. $(a - b)(a + b)$

D. $(a + b)(a - 1)$

Answer: D



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17. find value $(8x^3 + 11x) \div 3x$

A. $\frac{8}{3}x^2 + \frac{11}{3}$

B. $\frac{8}{3}x^3 + 11x$

C. $\frac{8}{3}x^2 + \frac{11}{3}x$

D. $24x^4 + 33x^2$

Answer: A



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18. The HCF of polynomials $x^3 - 1$ and $x^2 - 1$ is _____.

A. $x - 1$

B. $x + 1$

C. $x^2 - x + 1$

D. 1

Answer: A



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19. The factorized form of the polynomial $y^2 + (x - 1)y - x$ is

A. $(y + x - 1)(x + 1)$

B. $(y + 1)(x - 1)$

C. $(y - 1)(y + x)$

D. $(x - 1)(x + y)$

Answer: C



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20. if $a + b = 3$ and $ab = 2$, then find $a^3 + b^3$.

A. 6

B. 4

C. 9

D. 12

Answer: C



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21. The value of $51^3 + 49^3$ is

A. $5^6 2^4 - 300$

B. $5^6 2^4 + 300$

C. 250, 000

D. $5^6 2^4 + 299$

Answer: B

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22. If $x + y + z = 5$ and $xy + yz + zx = 7$, then $x^3 + y^3 + z^3 - 3xyz =$ _____.

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23. Factorization of the polynomial

$(x - y)^2 a^2 + 2(x - y)(x + y)ab + b^2(x + y)^2$ gives

- A. $(ax - by)(ax + by)$
- B. $(ax + by)(bx + ay)$
- C. $(ax - ay + bx + by)^2$
- D. $(ax + ay + bx + by)^2$

Answer: C

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24. The factors of the expression $x^2 - 2x - 63$ are _____.

- A. $x - 7, x - 9$
- B. $x + 7, x + 9$

C. $x + 7, x - 9$

D. $x - 7, x + 9$

Answer: C



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25. If $ab + bc + ca = 4$ and $abc = 2$, then find the value of

$$\frac{1}{a} + \frac{1}{b} + \frac{1}{c} \text{ -----}.$$

A. 2

B. 1

C. 0

D. -1

Answer: A



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26. Factorize $x^2 - y^2 + z^2 - a^2 + 2(xz + ay)$

A. $(x + y + z - a)(x - y + z - a)$

B. $(x + z - y + a)(x + y + z - a)$

C. $(x - y + z + a)(x + y - z + a)$

D. $(x - y - z - a)(x + y + z + a)$

Answer: B



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27. If $x + \frac{1}{x} = 7$ then $x^3 - \frac{1}{x^3}$ is

A. $9\sqrt{5}$

B. $144\sqrt{5}$

C. $135\sqrt{5}$

D. $\sqrt{5}$

Answer: B

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28. If $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = 1$ and $abc = 2$ then find $ab^2c^2 + a^2bc^2 + a^2b^2c$ is

A. 4

B. -4

C. 2

D. -2

Answer: A

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29. If $a^3 + b^3 = 5$ and $a + b = 1$, then find the value of ab .

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30. Simplify $\left(x^{\frac{2}{3}} - y^{\frac{2}{3}}\right)\left(x^{\frac{4}{3}} + x^{\frac{2}{3}}y^{\frac{2}{3}} + y^{\frac{4}{3}}\right)$

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31. If $x^3 + \frac{1}{x^3} = 62$, then find the value of $\sqrt{x^3} + \frac{1}{\sqrt{x^3}}$.

The following steps are involved in solving the above problem.

Arrange them in sequential order.

(A) $\therefore \left(\sqrt{x^3} + \frac{1}{\sqrt{x^3}}\right)^2 = 62 + 2 = 64$

(B) $\Rightarrow \left(\sqrt{x^3} + \frac{1}{\sqrt{x^3}}\right) = \sqrt{64} = 8$

(C) $\therefore \left(\sqrt{x^3} + \frac{1}{\sqrt{x^3}}\right)^2 = x^3 + \frac{1}{x^3} + 2$

(D) But $x^3 + \frac{1}{x^3} = 62$

A. CABD

B. ABCD

C. ACDB

D. CDAB

Answer: D



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32. The square of binomial is a _____.

A. Monomial

B. Binomial

C. Trinomial

D. None of these

Answer: C



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33. Which of the following is a binomial?

A. ax

B. $(x - y)^2$

C. $(x + y)^2$

D. $(x + y)(x - y)$

Answer: D



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Concept Application Level 2

1. If $x^2 + y^2 + xy = 1$ and $x + y = 2$, then find xy .

A. -3

B. 3

C. $-\frac{3}{2}$

D. $-\frac{2}{3}$

Answer: B



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2. 35. Factorization of the polynomial, $11x^2 - 10\sqrt{3}x - 3$ gives

A. $(x + \sqrt{3})(11x - \sqrt{3})$

B. $(x + 3\sqrt{3})(11x - \sqrt{3})$

C. $(x - \sqrt{3})(11x + \sqrt{3})$

D. $(x + \sqrt{3})(11x + \sqrt{3})$

Answer: C



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3. If $h(y) = y^2$ and $g(z) = z^3$, then the HCF of $h(b) - h(a)$ and $g(b) - g(a)$ is _____.

A. $a + b$

B. $a^2 - b^2$

C. $b - a$

D. $a - b$

Answer: C



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4. The HCF of the polynomials $(x^3 - 9^3)(x + 3)$ and $(x^2 - 9)(x^2 - 3)$ is _____.

A. $x + \sqrt{3}$

B. $x - 9$

C. $x + 3$

D. $x - 3$

Answer: C



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5. $x^2 + y^2 - z^2 - 2xy$

A. $(x - y - z)(x - y + z)$

B. $(x + y + z)(x - y + z)$

C. $(x + y + z)(x - y - z)$

D. $(x - y + z)(x + y - z)$

Answer: A



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6. The polynomial $x^3 + 8y^3 + 27z^3 - 18xyz$ on factorization gives _____.

A. $(x + 2y + 3z)(x^2 + 4y^2 + 9z^2 + 2xy + 6yz + 3zx)$

B. $(x + 2y + 3z)(x^2 + 4y^2 + 9z^2 + 4xy + 12yz + 6zx)$

C. $(x + 2y + 3z)(x^2 + 4y^2 + 9z^2 + 2xy - 6yz - 3zx)$

D. $(x + 2y + 3z)(x^2 + 4y^2 + 9z^2 - 2xy - 12yz - 6zx)$

Answer: C



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7. The polynomial $x^4 + 12x^2 + 64$ on factorization gives _____.

A. $(x^2 - 2x + 8)(x^2 + 2x - 8)$

B. $(x^2 - 2x - 8)(x^2 + 2x + 8)$

C. $(x^2 + 2x - 8)(x^2 - 2x - 8)$

D. $(x^2 - 2x + 8)(x^2 + 2x + 8)$

Answer: D

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8. The HCF of $(x - 1)(x^2 - 4)$ and $(x^2 - 1)(x + 2)$ is _____.

A. $x - 2$

B. $x + 1$

C. $x - 1$

D. $(x - 1)(x + 2)$

Answer: D

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9. The *HCF* and *LCM* of the polynomials $p(x)$ and $q(x)$ are $(x^2 + 2x)(x^2 - 20x + 91)$ and $2x^2(x^2 - 2x - 143)(x^2 - 5x - 14)$. If $p(x)$ is $x(x - 13)(x - 7)(x^2 + 13x + 22)$, then $q(x)$ is

A. $2x^2(x^2 - 20x + 91)(x - 2)$

B. $2x^2(x - 9)^2(x - 11)$

C. $2x^2(x^2 - 20x + 91)(x + 2)$

D. $2x^2(x^2 + 20x - 91)(x + 2)$

Answer: C



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10. The LCM of the polynomials $(x - 3)(x + 5)^2$, $(x + 5)(x - 7)^2$ and $(x - 7)(x - 3)^2$ is

_____.

A. $(x - 3)(x - 7)(x - 5)$

B. 1

C. $(x - 3)^2(x - 7)^2(x + 5)^2$

D. $(x - 3)^2(x - 7)^2$

Answer: C



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11. The factors of the expression

$a + b + c + 2\sqrt{ab} - 2\sqrt{bc} - 2\sqrt{ca}$ are _____.

A. $\sqrt{a} - \sqrt{b} + \sqrt{c}, \sqrt{a} - \sqrt{b} + \sqrt{c}$

B. $\sqrt{a} + \sqrt{b} - \sqrt{c}, \sqrt{a} - \sqrt{b} + \sqrt{c}$

C. $\sqrt{a} + \sqrt{b} - \sqrt{c}, \sqrt{a} + \sqrt{b} - \sqrt{c}$

D. $\sqrt{a} + \sqrt{b} - \sqrt{c}, \sqrt{a} + b - c$

Answer: C

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12. The HCF of two polynomials A and B using longdivision method was found to be $2x + 1$ after twosteps. The first two quotients obtained are x and $(x + 1)$. Find A and B. Given that degree of $A >$ degree of B.

A. $A = 2x^3 + 3x^2 + x - 1, B = 2x^2 - 3x + 1$

B. $A = 2x^3 - 3x^2 + x - 1, B = 2x^2 - 3x - 1$

C. $A = 2x^3 + 3x^2 - 3x - 1, B = 2x^2 - 3x + 1$

D. $A = 2x^3 + 3x^2 + 3x + 1, B = 2x^2 + 3x + 1$

Answer: D



13. The polynomial, $x^6 + 64y^6$ on factorization gives _____.

- A. $(x^2 + 4y^2)(x^4 - 4y^4)$
- B. $(x^2 + 4y^2)(x^4 - 4x^2y^2 + 16y^4)$
- C. $(x^2 - 4y^2)(x^4 + 4y^4)$
- D. $(x^2 + 4y^2)(x^4 + 4x^2y^2 + 16y^4)$

Answer: B

14. If the LCM of the polynomials $(x - 3)(x - p)$ and $(x + 3)(x + 5)$ is $(x - 3)(x + 3)(x - p)$, then p is _____.

A. -5

B. -4

C. -2

D. -1

Answer: A



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15. The number of terms which contain variables in the expansion of

$$\left(x + \frac{1}{x} + 1\right)^2 \quad (\text{A}) 6 \quad (\text{B}) 5 \quad (\text{C}) 4 \quad (\text{D}) 3$$

A. 6

B. 5

C. 4

D. 3

Answer: C



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16. If $(a + b + c)^2 = 36$, $ab + bc + ca = 11$ and $a, b, c \in N$, then find $a^2 + b^2 + c^2$.

A. 17

B. 22

C. 14

D. 6

Answer: C



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17. If $2x + \frac{y}{3} = 12$ and $xy = 30$, then find $8x^3 + \frac{y^3}{27}$.

A. 1008

B. 168

C. 106

D. 108

Answer: A



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18. Find the LCM of the polynomials $5(x^3 - y^3)$ and $35(x^6 - y^6)$.

A. $(x - y)$

B. $5(x^3 - y^3)$

C. $35(x^3 - y^3)$

D. $35(x^6 - y^6)$

Answer: D



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19. Find the HCF of the polynomials $6(x^2 - 36)$ and $36(x + 6)$.

A. $6(x + 6)$

B. $6(x - 6)$

C. $(x + 6)$

D. $(x - 6)$

Answer: A



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20. If $a^2 + b^2 + c^2 = 29$, $ab + bc + ca = 26$ and $a, b, c \in N$, then find $a + b + c$.

A. 9

B. 6

C. 7

D. 10

Answer: A

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21. If $3x - \frac{y}{5} = 10$ and $xy = 5$, then find $27x^3 - \frac{y^3}{125}$

A. 1060

B. 1150

C. 112

D. 1000

Answer: B

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Concept Application Level 3

1. If $a + b + c = 6$ and $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = \frac{3}{2}$, then find $\frac{a}{b} + \frac{a}{c} + \frac{b}{a} + \frac{b}{c} + \frac{c}{a} + \frac{c}{b}$.

A. 6

B. 4

C. 9

D. 12

Answer: A



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2. If $\left(\frac{a}{b}\right) + \left(\frac{b}{a}\right) = 2$, then find $\left(\frac{a}{b}\right)^{100} - \left(\frac{b}{a}\right)^{10}$

A. $\frac{2^{20} - 1}{2^{10}}$

B. 2

C. 0

D. $\frac{2^{20} + 1}{2^{10}}$

Answer: C



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3. factors of $x^4 + y^4 - x^2y^2 =$ _____.

A. $(x^2 + y^2 + \sqrt{3}xy)(x^2 + y^2 - \sqrt{3}xy)$

B. $(x^2 - y^2 + \sqrt{3}xy)(x^2 - y^2 - \sqrt{3}xy)$

C. $(x^2 - y^2 + \sqrt{3}xy)(y^2 - x^2 - \sqrt{3}xy)$

D. $(x^2 + y^2 - \sqrt{3}xy)(x^2 + y^2 - \sqrt{3}xy)$

Answer: A



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4. If $p(x) = (x - 4)^p(x + 6)^5$, $q(x) = (x + 6)^q(x - 4)^6$ and LCM of $p(x)$ and $q(x)$ is $(x - 4)^6(x + 6)^q$, then find the maximum value of $(p - q)$

A. -1

B. 0

C. 1

D. 11

Answer: C



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5. If $x^2 + y^2 - xy = 3$ and $y - x = 1$, then find $\frac{xy}{x^2 - y^2}$.

A. $\frac{2}{5}$

B. $\frac{5}{2}$

C. $\frac{3}{5}$

D. $\frac{5}{3}$

Answer: A



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6. If $abc = 6$ and $a + b + c = 6$, then find the value of

$$\frac{1}{ac} + \frac{1}{ab} + \frac{1}{bc}.$$

A. 2

B. 1

C. 3

D. 0

Answer: B



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