

MATHS

BOOKS - PEARSON IIT JEE FOUNDATION

ALGEBRA

Example

1. Find the number of terms in the following expressions.

(i) $3x^2y$ (ii) $4x^3 - y^3$ (iii) $5x^5 + y - 2$



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2. Name the following algebraic expressions with respect to the number of terms.

(I) $2x^2y - 7x + 6$ (II) $3xy - 5$ (III) $-8x$

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3. Write the following expressions in the exponential forms.

(I) $2 \times 5 \times 7 \times x \times x \times x \times y \times y$

$3 \times 3 \times 3 \times 11 \times x \times x \times x \times x \times x \times y \times y$

(III) $2 \times 3 \times 5 \times x \times y \times x \times y \times x \times y \times y$

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4. Let $A = 3x^2 - 7xy + 6$ and $B = 7xy - 5x^2 + 15$

Find.

(I) $A + B$ (II) $2A + B$

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5. Let $A = 3x^2 - 7xy + 6$ and $B = 7xy - 5x^2 + 15$

Find.

(I) $A - B$ (II) $3A - 2B$



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6. Simplify : $8m - [3m - \{3m - \{2m + 3 - 2(4m - 4)\}]$



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7. Multiply $(2x^2 - 4x + 6y)$ by $3xy$



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8. Simplify $5(2x - 3) - x(3 - 2x) + 2x^2$



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9. Find the product of polynomial $(x+2)$ and $(2x+3)$



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10. Divide $16x^3 + 12x^2 + 6x$ by $4x$



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11. Solve for x : $5x-6=9$

A. $x = 3$

B. $x = 1$

C. $x = -3$

D. $x = 2$

Answer: A



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12. Solve for x : $\frac{3x}{2} + \frac{x}{3} = x + \frac{x}{6} + 6$



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13. The sum of two consecutive odd numbers is 164. Find the numbers

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14. The present age of a person is $\frac{1}{3}$ of the present age of his father. If the sum of their ages is 60 years, then find the age of the son

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Test Your Concepts Very Short Answer Type Questions

1. A quantity which has no fixed value is called a/an _____

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2. A quantity which has a fixed numerical value is called a/an _____

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3. A combination of constants and variables connected by one or more fundamental operations is a/an _____

A. algebraic expression

B. Equation

C. Variable

D. None of these

Answer: A

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4. The exponents of the variables of a polynomial must be _____ integers.

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5. The terms having same literal coefficients are called _____



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6. Which of the following is a polynomial?

A. $3x - \frac{2}{3} = 0$

B. $x^2 - \sqrt{3} = 0$

C. $\sqrt{x} + 5 = 0$

D. $x + x^{3/2} = 0$

Answer: B



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7. The degree of the polynomial $8x^2 - 7x^6 + 6x^5 - 15x^2$ is _____



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8. Which of the following is a trinomial ?

A. xyz

B. $x^2 - xy = 3$

C. x^3

D. None of these

Answer: D



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9. The numerical coefficient of $2x^5y^3$ is _____

A. 5

B. 6

C. 8

D. 2

Answer: D



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10. The number of second degree terms in the expression

$$2x^3 - 3x^2y + 5x^2 - 6y^2 + 8x^2y - 4x^2y^2 \text{ is } \underline{\hspace{2cm}}$$

A. 3

B. 2

C. 1

D. 4

Answer: C



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11. Match the following Column A to Column B

Column A (Polynomial)	Column B (Degree of the polynomial)
(a) $9x^3 + 7x^2 + 6x + 5$	(p) 2
(b) $\frac{3}{5}x^2 - 7x^4 - 2$	(q) 3
(c) $8x^5 - 9x^6 + 4$	(r) 4
(d) $5x^2 - 8x + 3$	(s) 5 (t) 6

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12. $3x^2y + 7x^2y = \underline{\hspace{2cm}}$

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13. $\frac{5}{x}x^2 - \frac{3}{2} - \frac{3}{2}x^2 = \underline{\hspace{2cm}}$

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14. 2017 $xy - 2xy =$ _____



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15. $\frac{3}{4}(4x - 8) =$ _____



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16. $\frac{2xy - 6x}{2x} =$ _____



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17. $\frac{2}{3}x + 3x + \frac{1}{3}x$ _____

A. $4x$

B. $\frac{5}{3}x$

C. $\frac{3}{5}(x)$

D. $\frac{5}{2}x$

Answer: A



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18. $2 - 2\left(x - \frac{1}{2}\right) = \text{-----}$

A. x

B. $2x$

C. 2

D. 1

Answer: D



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19. $2x(3-2x)=$ _____

A. $6x - 4x^2$

B. $6x - 2zx^2$

C. $3-4x$

D. $3 - 4x^2$

Answer: A



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20. $\frac{4x^2 - 8x + 10}{2}$ _____

A. $2x^2 - 4x + 5$

B. $2x^2 - 8x + 10$

C. $2x^2 - 4x + 10$

D. $2x^2 - 8x + 5$

Answer: A



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21. $\left(\frac{2}{3}x - \frac{1}{3x}\right) = \text{-----}$

A. $2x^2 - 3$

B. $2x^2 - 1$

C. $2x-1$

D. $2x^2 - 2$

Answer: B



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22. Match the following Column A to Column B

Column A	Column B
(a) $\frac{3x}{2} (2x - 3)$ ()	(p) $3x^2 - \frac{9x}{2}$
(b) $\frac{2x}{3} (3x - 2)$ ()	(q) $\frac{9x^2}{2} - 3x$
(c) $\frac{3x}{2} (3x - 2)$ ()	(r) $2x^2 - \frac{4x}{3}$
(d) $\frac{2x}{3} (2x - 3)$ ()	(s) $\frac{4x^2}{3} - 2x$



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23. If $x+5=8$, then $x=$ _____

A. $x = 0$

B. $x = 3$

C. $x = -3$

D. $x = 13$

Answer: B

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24. If $\frac{1}{x}x + \frac{3}{4} = 1$ then $x =$ _____

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25. If $\frac{3x}{5} + \frac{7x}{5} = 2$, then $x =$ _____

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26. If $2x-5=7$, then $x =$ _____

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27. If $12+x=18-x$, then $x =$ _____

A. 15

B. 30

C. 6

D. 3

Answer: D



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28. The highest power of the variable in a linear equation is _____

A. 0

B. 1

C. 2

D. Can be of any value

Answer: B



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29. The number of value(s) of x , which satisfy $7x+2=8x+2$ is _____

A. 1

B. 0

C. -1

D. 2

Answer: B



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30. The sum of two consecutive natural number is 45. Which of the following represents the above statements ?

A. $(x+1)+(x+2) = 45$

B. $(x)+(x+1) = 45$

C. $(x-1)+x = 45$

D. All the above

Answer: B



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31. The age of a man is 4 times his son's age and the sum of their ages is 60 years. Which of the following represents the above statements?

A. $x=60-4x$

B. $4x-x=60$

C. $x+4x=60$

D. $4x+60=x$

Answer: C



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32. Match the following Column A to Column B

Column A		Column B	
(a) $2x - 7 = 15$	()	(p) 12	
(b) $2x - 15 = 9$	()	(q) 11	
(c) $2x + 5 = 23$	()	(r) 9	
(d) $2x + 4 = 20$	()	(s) 8	



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Short Answer Type Questions

1. State which of the following statement is true.

A. The coefficient of x in the expression $4xy^2$ is 4

B. the number of terms in the expression $4xy$ is 3.

C. $x^2y^3 - xy$ is a binomial

D. $3x^2 - 2x + 2/3$ is not a polynomial

Answer: C



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2. List of the like terms in the following expression.

(i) $4x^4, -7x^3, 8x^2, 12x^3, -9x^4, -5x, 4x^3, 12x^2$

(ii) $5xy, -3x^2y, 2xy^3, -2x^2y^2, 5x^2y, -3xy, 6x^2y^2$



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3. Which of the following algebraic expression are polynomials?

(i) $x^{1/2} + y^{1/2} + z^{1/2}$ (ii) $x^2 + y^2$

(iii) $\sqrt{x} + 3$

$\sqrt{5} + x^5$

(v) 2016



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4. Write the degree for the following polynomials.

(i) $3x^5 - 7x^2 + 8x - 2x^2 + 10$

(ii) $2x^9 - 3x^2 - 14x^3 - 15x^4$



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5. Write the numerical coefficients of the followings .

$17x^2y$

$12xy^3$

$\frac{3}{5}x$

$-\frac{3}{2}x^2$

A. $17x^2y$

B. $12xy^3$

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

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

Answer: A::B::C



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6. If $x=3$ and $y=1$, then find the values of

$$(i) 3x - 2y \quad (ii) \frac{22}{3}x^2 - \frac{7}{2}y^2$$



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7. If $x=2$ and $y=3$, then find the values of

$$(i) \frac{2x + 3y}{4x - 3y} \quad (ii) \frac{2x^2 - 7x + 2y}{2y^2 - 7y + 2x}$$



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8.

$$A = 2x + 3xy + 7x^2, B = 3x - 2xy - 5x^2 \text{ and } C = 2xy - 6x^2 - 3x.$$

Find the value of $A+B-C$.



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9. Find the product of $(12x)$ and $\left(5x - \frac{3}{2}\right)$



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10. Find the product of $(2x+3)$ and $(3x-2)$



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11. What should be added to $2xy - 3x^2 + 6$ so that the sum is $4x^2 - 7xy + 15$?



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12. What should be subtracted from $\frac{3}{2}x - \frac{7}{2}$ so that the difference is $\frac{7x}{2} - \frac{3}{2}$?



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13. Simplify: $\frac{8x^2 - 12x^3 + 6x}{2x}$

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14. Simplify: $3x - [4x + \{2 = 6(x - \overline{2 - x})\}]$

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15. Simplify: $\frac{15}{2} \times \frac{4}{3} [6x^2 - 9x(x - \overline{3 - 2x})]$

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16. Solve for x: $3x+7=18x$

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17. Solve x: $\frac{x}{4} = 6x - \frac{5}{4}$

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18. Solve for x : $\frac{2x}{3} + 4 = \frac{8}{3}(2x - 6)$

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19. Write the following statemens in symbolic form.

- (i) A number si doubled and edded to 6, the result is equal to 14
- (ii) The sum of a number and three fifth of the number is equal to 24.
- (iii) Twenty years ago, the age of man was half of his preent age.

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20. The sum of three consecutive natural numbers is 90. Find the greatest number.

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21. The length of a reactanle is 5 cm more than its bredth. If the perimeter of the rectangle is 42, cm , then find the length of the reactangle.

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22. The cost of pizza is $2\frac{1}{2}$ times the cost of a burger. If the sum of cost of one burger a and one pizza is Rs. 105, then find the cost of the burger.

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23. Chintu's pocket money is Rs. 120. He saves one third of his expenditure. Find his savings.

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24. Rani has some chocolates with her. If she gives $\frac{2}{5}$ of the chocolates to her brother and $\frac{1}{3}$ of total chocolates to her sister, then she is left with 20 chocolates. Find the number of chocolates tht Rani had initially.

A. 75

B. 60

C. 15

D. None of these

Answer: A

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25. Rukku has $\frac{3}{4}$ of the number of flowers that Satya has. The number of flowers with Rukku and Satya is 35, then find the number of flowers with Satya.

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Concept Application

1. If $A = 2x^3 - 3x^2 - 4x + 5$, $B = 2x^2 - x^3 + 1$ and $C = x^2 + x + 2$, then find the degree of $A+2B-C$.

A. 0

B. 1

C. 2

D. 3

Answer: B



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2. Simplify : $3x^2 - [7x - \{5x^2 - (2x - 3)(4x - 2) - 5\} - 2]$

A. $9x-9$

B. $8x-9$

C. $7x-9$

D. $6x-9$

Answer: A



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3. A bag consists of Rs.1, Rs.2 and Rs. 5 coins. The number of Rs. 2 coins is equal to twice the number of Rs. 1 coins. The number of Rs. 5 is equal to thrice the number of Rs. 2 coins. If the total amount in the bag is Rs. 700, then find the total number of coins in the bag.

A. 150

B. 160

C. 280

D. 200

Answer: C



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4. Let the ABC be a rectangle of four sides

$$AB = (2x + 3y + 10)cm, BC = (2x + 3y - 5)cm, CD = (4x + 3y + 6)cm$$

. Find the perimeter of the rectangle

A. 30 cm

B. 40 m

C. 50 cm

D. 60 cm

Answer: C



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5. Mohan has some amount, he gave $(1/3)$ rd of the amount to Vijay, $(2/5)$ th of the gave to Suresh and left with 500 Rs .Represent Mohan amount as the sum of money he has given to both Vijay and Suresh.

$$A. x = \frac{x}{3} + \frac{2x}{5}$$

B. $x = \frac{x}{3} + \frac{2x}{5} + 500$

C. $x + 500 = \frac{x}{3} + 2\frac{x}{5}$

D. None of the above

Answer: B



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Assessment Test

1. Name the following algebraic expressions based on the number of terms.

A. $2018x^{2019}$

B. $x+2019$

C. $2017x$

D. $\sqrt{3}x + \sqrt{5} + y$

Answer: A::B



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2. Write degree of the following polynomials.

(i) $2017x^7 + 2018x^6 + 2019x^5$

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

(iii) 2018



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3. Write the expression for the following statements

(i) 5 times of x is added to 3 times of y

(ii) One and half times of x is subtracted from 3 and half time of y.



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4. If $x=5$ and $y=-2$, then find the value of

(i) $\frac{8x - 2y + 5}{2x + 4ty + 12}$

(ii) $\frac{5x - 6y - 7}{3x + 6y + 12}$

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5. What should be added to $7x + 5 - 8x^2$, so that the sum is $15x + 9x - 5$?

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6. What should be subtracted from $2x^2 - 3x + 14$, that the difference is $5x^2 + 7x - 5$?

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7. Simplify $8x - 2[2x - 3(4x + 5 - \overline{2 - x})]$

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8. Solve for x : $2x-15=3x-20$

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9. Solve for x : $\frac{2x}{3} - \frac{x}{2} + 2x = 0$

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10. The sum of the predecessor and successor of a number is 116. Find the number.

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11. The sum of the ages of a man and his daughter is 56 years. If the daughter's age is $\frac{1}{3}$ of his father's age, find the age of the daughter.

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12. If $x=6$ and $y=5$, then find the values of the following

A. $x+y$

B. $x-y$

C. $3x/2y$

D. $3y/2x$

Answer: (i) 11

(ii) 1

(iii) $9/5$

(iv) $5/4$



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13. If $x=1$, $y=2$ and $z=3$, find the value of $4x^2yz$



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14. Write an algebraic expression that describes the sum of x and 30% of z subtracted from the product of x and y .



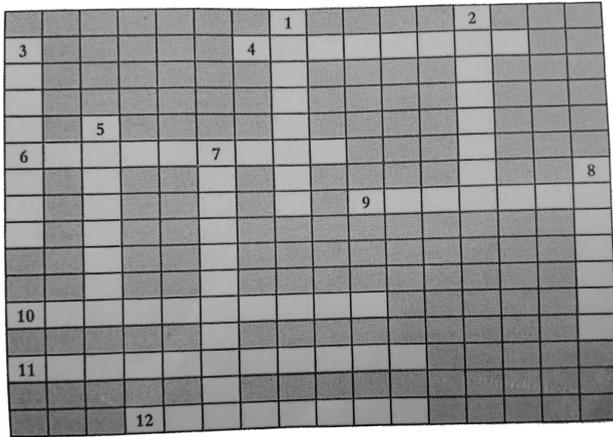
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15. Ajay buys 8 cookies costing Rs. Each. If he gives the shopkeeper Rs. 50, how much change does he get back?



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Crossword



1.

(, Across, , Down), (4. , There are no terms in the polynomial except the t
(6. , The expansion of the square of $(x + y)$, , 2. , This one is also called a li
, 3. , Two algebraic expressions are connected by the symbol=), (10. , It is a
(11. , $x + x + x = 3x$, 3 is, , 7. , An algebraic expressin which has two or r



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