

Algebra (Introduction)

Question Paper, Set 09

Time: 1 hour 30 minutes

Maximum marks: 50

Name: _____ Class: _____ Date: _____

1. Answer all 20 questions. The marks for each question are shown in brackets.
2. Show your working for the 2, 3 and 5 mark questions.
3. The key sheet and worked solutions are at the end of this paper.

1. Which of the following is a constant: q , -24 , p , z ? [1 mark]
2. From y , $\frac{7}{8}$, $-\frac{1}{7}$, c , $-\frac{1}{3}$, t , write (i) the variables (ii) the constants. [2 marks]
3. Represent in symbolic form: the product of 19 and m . [1 mark]
4. Represent the following statements in symbolic form: (i) Divide z by 8 (ii) The subtraction of $4z$ from 13 [2 marks]
5. Represent the following statements in symbolic form: (i) 43 more than p (ii) m decreased by 60 (iii) Divide p by 7 (iv) 16 divided by q (v) 10 times t added to 11 times a [5 marks]
6. Represent the following statements in symbolic form: (i) 8 more than one third of c (ii) 13 less than one third of m [2 marks]
7. Simplify $1 \times xyz$. [1 mark]
8. Simplify: (i) $\frac{pqt}{-1}$ (ii) $0 \times bc$ (iii) $\frac{p}{1}$ [3 marks]
9. Write the terms in $3c - 19 + 12qr + 4yz$. [1 mark]
10. Write $24ac$ as a product of its factors and name the factors. [2 marks]
11. In $-19mnq$, write the coefficient of (i) mnq (ii) q (iii) mn . [3 marks]
12. Write the coefficient of xz in $\frac{xz}{12}$. [1 mark]
13. State whether the following are like (or) unlike terms. Give reason. (i) 15, $15pqt$ (ii) $-\frac{9}{4}pq$, $-\frac{3}{2}qp$ [2 marks]
14. State whether the following are like (or) unlike terms. Give reason. (i) $10n$, $-6n$ (ii) $-5n$, -5 (iii) $7pr$, $-\frac{3}{2}pr$ (iv) $-\frac{12}{5}yz$, $15yz$ (v) $-15bq$, $-9b$ [5 marks]
15. Find the sum of $19ab$ and $5ab$. [1 mark]
16. Add: $7y + 23y + 14y$. [2 marks]
17. Simplify $14b + 8t + 7y + 9t + 12y + 14b$. [3 marks]

18. Simplify: (i) $-13n + 11n$ (ii) $25n - 14n$ (iii) $-27n - 26n$ [3 marks]

19. Simplify: (i) $26xy + 5xy$ (ii) $-26xy - 5xy$ (iii) $-26xy + 5xy$ (iv) $26xy - 5xy$ (v) $-25xy + 25xy$ [5 marks]

20. Simplify: (i) $6mp - 20y + 7y + 3mp$ (ii) $14xy - 16ac - 13 - 10xy + 13ac - 8$ [5 marks]

Key sheet

Q	Answer
1	-24
2	(i) y, c, t (ii) $\frac{7}{8}, -\frac{1}{7}, -\frac{1}{3}$
3	$19m$
4	(i) $\frac{z}{8}$, (ii) $13 - 4z$
5	(i) $p + 43$, (ii) $m - 60$, (iii) $\frac{p}{7}$, (iv) $\frac{16}{q}$, (v) $11a + 10t$
6	(i) $\frac{c}{3} + 8$, (ii) $\frac{m}{3} - 13$
7	xyz
8	(i) $-pqt$, (ii) 0 , (iii) p
9	$3c, -19, 12qr, 4yz$
10	$24ac = 24 \times a \times c$; factors $24, a, c$
11	(i) -19 , (ii) $-19mn$, (iii) $-19q$
12	$\frac{1}{12}$
13	(i) Unlike, (ii) Like
14	(i) Like, (ii) Unlike, (iii) Like, (iv) Like, (v) Unlike
15	$24ab$
16	$44y$
17	$28b + 17t + 19y$
18	(i) $-2n$, (ii) $11n$, (iii) $-53n$
19	(i) $31xy$, (ii) $-31xy$, (iii) $-21xy$, (iv) $21xy$, (v) 0
20	(i) $9mp - 13y$, (ii) $4xy - 3ac - 21$

Solutions

1. Which of the following is a constant: q , -24 , p , z ? [1]

A constant has a fixed value. A variable can take various numerical values.

q , z and p can take various values, so they are variables.

-24 has a fixed value, so it is the constant.

Ans: -24

2. From y , $\frac{7}{8}$, $-\frac{1}{7}$, c , $-\frac{1}{3}$, t , write (i) the variables (ii) the constants. [2]

Variables can take various numerical values: y , c and t .

Constants have a fixed value: $\frac{7}{8}$, $-\frac{1}{7}$ and $-\frac{1}{3}$.

Ans: (i) y, c, t (ii) $\frac{7}{8}, -\frac{1}{7}, -\frac{1}{3}$

3. Represent in symbolic form: the product of 19 and m . [1]

Multiply: $19 \times m = 19m$

Ans: $19m$

4. Represent the following statements in symbolic form: (i) Divide z by 8 (ii) The subtraction of $4z$ from 13 [2]

(i) z divided by 8 is $\frac{z}{8}$

(ii) Take $4z$ away from 13. $13 - 4z$

Ans: (i) $\frac{z}{8}$, (ii) $13 - 4z$

5. Represent the following statements in symbolic form: (i) 43 more than p (ii) m decreased by 60 (iii) Divide p by 7 (iv) 16 divided by q (v) 10 times t added to 11 times a [5]

(i) 43 more than p : add 43 to p . $p + 43$

(ii) Take 60 away from m . $m - 60$

(iii) p divided by 7 is $\frac{p}{7}$

(iv) 16 divided by q is $\frac{16}{q}$

(v) 10 times t is $10t$; 11 times a is $11a$. Add $10t$ to $11a$: $11a + 10t$

Ans: (i) $p + 43$, (ii) $m - 60$, (iii) $\frac{p}{7}$, (iv) $\frac{16}{q}$, (v) $11a + 10t$

6. Represent the following statements in symbolic form: (i) 8 more than one third of c (ii) 13 less than one third of m [2]

(i) One third of c is $\frac{c}{3}$. 8 more than it: add 8. $\frac{c}{3} + 8$

(ii) One third of m is $\frac{m}{3}$. 13 less than it: take away 13. $\frac{m}{3} - 13$

Ans: (i) $\frac{c}{3} + 8$, (ii) $\frac{m}{3} - 13$

7. Simplify $1 \times xyz$. [1]

Rule: $1 \times a = a$

$1 \times xyz = xyz$

Ans: xyz

8. Simplify: (i) $\frac{pqt}{-1}$ (ii) $0 \times bc$ (iii) $\frac{p}{1}$ [3]

(i) Rule $\frac{a}{-1} = -a$, so $\frac{pqt}{-1} = -pqt$

(ii) Rule $0 \times a = 0$, so $0 \times bc = 0$

(iii) Rule $\frac{a}{1} = a$, so $\frac{p}{1} = p$

Ans: (i) $-pqt$, (ii) 0 , (iii) p

9. Write the terms in $3c - 19 + 12qr + 4yz$. [1]

The terms are separated by $+$ and $-$ signs; each term keeps the sign in front of it.

The terms are $3c$, -19 , $12qr$ and $4yz$.

Ans: $3c$, -19 , $12qr$, $4yz$

10. Write $24ac$ as a product of its factors and name the factors. [2]

$$24ac = 24 \times a \times c$$

Each numerical (or) literal value in the product is a factor: 24 , a , c .

Ans: $24ac = 24 \times a \times c$; factors 24 , a , c

11. In $-19mnq$, write the coefficient of (i) mnq (ii) q (iii) mn . [3]

(i) $-19mnq = -19 \times mnq$, so the coefficient of mnq is -19 .

(ii) $-19mnq = -19mn \times q$, so the coefficient of q is $-19mn$.

(iii) $-19mnq = -19q \times mn$, so the coefficient of mn is $-19q$.

Ans: (i) -19 , (ii) $-19mn$, (iii) $-19q$

12. Write the coefficient of xz in $\frac{xz}{12}$. [1]

$$\frac{xz}{12} = \frac{1}{12} \times xz$$

So the coefficient of xz is $\frac{1}{12}$.

Ans: $\frac{1}{12}$

13. State whether the following are like (or) unlike terms. Give reason. (i) 15 , $15pqt$ (ii) $-\frac{9}{4}pq$, $-\frac{3}{2}qp$ [2]

(i) 15 has no literal factor, $15pqt$ has literal factors pqt : different, so unlike terms.

(ii) $-\frac{9}{4}pq$, $-\frac{3}{2}qp$: the same literal factors pq ($qp = pq$), so like terms.

Ans: (i) Unlike, (ii) Like

14. State whether the following are like (or) unlike terms. Give reason. (i) $10n$, $-6n$ (ii) $-5n$, -5 (iii) $7pr$, $-\frac{3}{2}pr$ (iv) $-\frac{12}{5}yz$, $15yz$ (v) $-15bq$, $-9b$ [5]

(i) $10n$, $-6n$: the same literal factors n , so like terms.

(ii) $-5n$ has literal factors n , -5 has no literal factor: different, so unlike terms.

(iii) $7pr$, $-\frac{3}{2}pr$: the same literal factors pr , so like terms.

(iv) $-\frac{12}{5}yz$, $15yz$: the same literal factors yz , so like terms.

(v) $-15bq$ has literal factors bq , $-9b$ has literal factors b : different, so unlike terms.

Ans: (i) Like, (ii) Unlike, (iii) Like, (iv) Like, (v) Unlike

15. Find the sum of $19ab$ and $5ab$. [1]

$$19ab + 5ab = (19 + 5)ab$$

$$= 24ab$$

Ans: $24ab$

16. Add: $7y + 23y + 14y$. [2]

$$7y + 23y + 14y = (7 + 23 + 14)y$$

$$= 44y$$

Ans: $44y$

17. Simplify $14b + 8t + 7y + 9t + 12y + 14b$. [3]

Bring the like terms together and add.

$$14b + 8t + 7y + 9t + 12y + 14b = (14b + 14b) + (8t + 9t) + (7y + 12y)$$

$$= (14 + 14)b + (8 + 9)t + (7 + 12)y$$

$$= 28b + 17t + 19y$$

Ans: $28b + 17t + 19y$

18. Simplify: (i) $-13n + 11n$ (ii) $25n - 14n$ (iii) $-27n - 26n$ [3]

$$(i) -13n + 11n = (-13 + 11)n = -2n$$

$$(ii) 25n - 14n = (25 - 14)n = 11n$$

$$(iii) -27n - 26n = (-27 - 26)n = -53n$$

Ans: (i) $-2n$, (ii) $11n$, (iii) $-53n$

19. Simplify: (i) $26xy + 5xy$ (ii) $-26xy - 5xy$ (iii) $-26xy + 5xy$ (iv) $26xy - 5xy$ (v) $-25xy + 25xy$ [5]

$$(i) 26xy + 5xy = (26 + 5)xy = 31xy$$

$$(ii) -26xy - 5xy = (-26 - 5)xy = -31xy$$

$$(iii) -26xy + 5xy = (-26 + 5)xy = -21xy$$

$$(iv) 26xy - 5xy = (26 - 5)xy = 21xy$$

$$(v) -25xy + 25xy = (-25 + 25)xy = 0 \times xy = 0$$

Ans: (i) $31xy$, (ii) $-31xy$, (iii) $-21xy$, (iv) $21xy$, (v) 0

20. Simplify: (i) $6mp - 20y + 7y + 3mp$ (ii) $14xy - 16ac - 13 - 10xy + 13ac - 8$ [5]

$$(i) 6mp - 20y + 7y + 3mp = (6mp + 3mp) + (-20y + 7y)$$

$$= (6 + 3)mp + (-20 + 7)y$$

$$= 9mp - 13y$$

$$(ii) 14xy - 16ac - 13 - 10xy + 13ac - 8 = (14xy - 10xy) + (-16ac + 13ac) + (-13 - 8)$$

$$= (14 - 10)xy + (-16 + 13)ac + (-13 - 8)$$

$$= 4xy - 3ac - 21$$

Ans: (i) $9mp - 13y$, (ii) $4xy - 3ac - 21$
