

## EXERCISE 18(B)

### Question 1.

Separate the constants and the variables from each of the following:

$$6, 4y, -3x, \frac{5}{4}, \frac{4}{5}xy,$$

$$az, 7p, 0, \frac{9x}{y}, \frac{3}{4x}, -\frac{xz}{3y}$$

**Solution:**

$$\text{Constants } 6, \frac{5}{4}, 0$$

$$\text{Variables } 4y, -3x, \frac{4}{5}xy, az, 7p,$$

$$\frac{9x}{y}, \frac{3}{4x}, -\frac{xz}{3y}$$

### Question 2.

Group the like terms together :

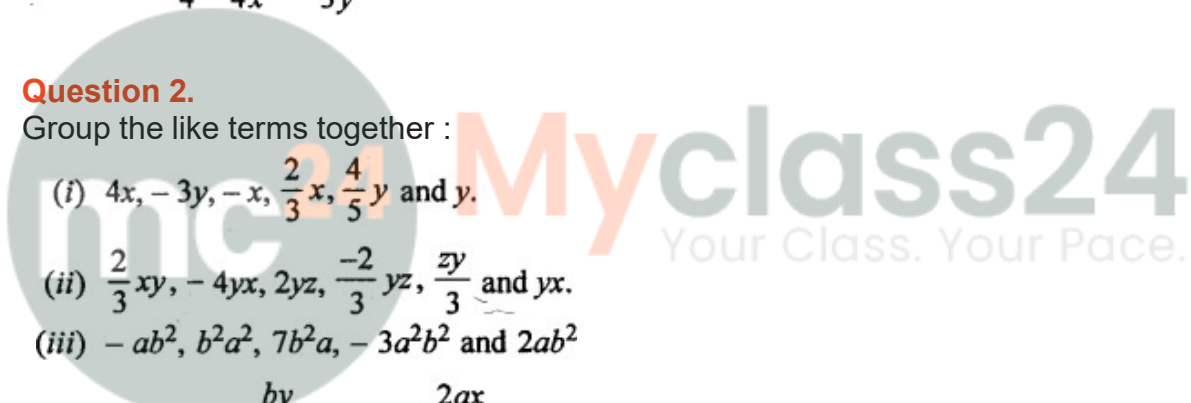
(i)  $4x, -3y, -x, \frac{2}{3}x, \frac{4}{5}y$  and  $y$ .

(ii)  $\frac{2}{3}xy, -4yx, 2yz, -\frac{2}{3}yz, \frac{zy}{3}$  and  $yx$ .

(iii)  $-ab^2, b^2a^2, 7b^2a, -3a^2b^2$  and  $2ab^2$

(iv)  $5ax, -5by, \frac{by}{7}, 7xa$  and  $\frac{2ax}{3}$ .

**Solution:**



$$(i) 4x, -x, \frac{2}{3}x$$

$$\text{and } -3y, \frac{4}{5}y, y$$

$$(ii) \frac{2}{3}xy, -4yx, yx$$

$$\text{and } 2yz, \frac{-2}{3}yz, \frac{zy}{3}$$

$$(iii) -ab^2, 7b^2a, 2ab^2$$

$$\text{and } b^2a^2, -3a^2b^2$$

$$(iv) 5ax, 7xa \text{ and } \frac{2ax}{3}$$

$$\text{and } -5by, \frac{by}{7}$$

### Question 3.

State whether true or false :

(i) 16 is a constant and y is a variable but 16y is variable.

(ii) 5x has two terms 5 and x.

(iii) The expression  $5 + x$  has two terms 5 and x

(iv) The expression  $2x^2 + x$  is a trinomial.

(v)  $ax^2 + bx + c$  is a trinomial.

(vi)  $8x + ab$  is a binomial.

(vii)  $8 + ab$  is a binomial.

(viii)  $x^3 - 5xy + 6x + 7$  is a polynomial.

(ix)  $x^3 - 5xy + 6x + 7$  is a multinomial.

(x) The coefficient of x in 5x is 5x.

(xi) The coefficient of ab in  $-ab$  is  $-1$ .

(xii) The coefficient of y in  $-3xy$  is  $-3$

**Solution:**

(i) True

(ii) False

(iii) True

(iv) False

(v) True

(vi) False

(vii) True

(viii) True

(ix) True

(x) False

(xi) True

(xii) False

**Question 4.**

State the number of terms in each of the following expressions :

(i)  $2a - b$       (ii)  $3 \times x + \frac{a}{2}$

(iii)  $3x - \frac{x}{p}$       (iv)  $a \div x \times b + c$

(v)  $3x \div 2 + y + 4$       (vi)  $xy \div 2$

(vii)  $x + y \div a$       (viii)  $2x + y + 8 \div y$

(ix)  $2 \times a + 3 \div b + 4$

**Solution:**

(i) 2 terms

(ii) 2 terms

(iii) 2 terms

(iv) 2 terms

(v) 3 terms

(vi) 2 term

(vii) 2 terms

(viii) 3 terms

(ix) 3 terms

**Question 5.**

State whether true or false:

(i)  $xy$  and  $-yx$  are like terms.

(ii)  $x^2y$  and  $-y^2x$  are like terms.

(iii)  $a$  and  $-a$  are like terms.

(iv)  $-ba$  and  $2ab$  are unlike terms.

(v)  $5$  and  $5x$  are like terms.

(vi)  $3xy$  and  $4xyz$  are unlike terms.

**Solution:**

(i) True

(ii) False

(iii) True

(iv) False

(v) False

(vi) True

**Question 6.**

For each expression, given below, state whether it is a monomial, or a binomial or a trinomial.

(i)  $xy$       (ii)  $xy + x$       (iii)  $2x \div y$

(iv)  $-a$       (v)  $ax^2 - x + 5$       (vi)  $-3bc + d$

(vii)  $1 + x + y$       (viii)  $1 + x \div y$       (ix)  $x + xy - y^2$

**Solution:**

(i) Monomial

- (ii) Binomial
- (iii) Monomial
- (iv) Monomial
- (v) Trinomial
- (vi) Binomial
- (vii) Trinomial
- (viii) Binomial
- (ix) Trinomial

**Question 7.**

Write down the coefficient of  $x$  in the following monomial :

(i)  $x$       (ii)  $-x$       (iii)  $-3x$

(iv)  $-5ax$    (v)  $\frac{3}{2}xy$    (vi)  $\frac{ax}{y}$

**Solution:**

(i) 1      (ii)  $-1$       (iii)  $-3$

(iv)  $-5a$    (v)  $\frac{3}{2}y$    (vi)  $\frac{a}{y}$

**Question 8.**

Write the coefficient of :

(i)  $x$  in  $-3xy^2$       (ii)  $x$  in  $-ax$

(iii)  $y$  in  $-y$       (iv)  $y$  in  $\frac{2}{a}y$

(v)  $xy$  in  $-2xyz$       (vi)  $ax$  in  $-axy^2$

(vii)  $x^2y$  in  $-3ax^2y$       (viii)  $xy^2$  in  $5axy^2$

**Solution:**

(i)  $-3y^2$       (ii)  $-a$       (iii)  $-1$

(iv)  $\frac{2}{a}$       (v)  $-2z$       (vi)  $-y^2$

(vii)  $-3a$       (viii)  $5a$

**Question 9.**

State the numeral coefficient of the following monomials :

(i)  $5xy$       (ii)  $abc$       (iii)  $5pqr$

(iv)  $\frac{-2x}{y}$       (v)  $\frac{2}{3}xy^2$       (vi)  $\frac{-15xy}{2z}$

(vii)  $-7x \div y$

(viii)  $-3x \div (2y)$

**Solution:**

(i) 5            (ii) 1            (iii) 5

(iv) -2            (v)  $\frac{2}{3}$             (vi)  $-\frac{15}{2}$

(vii)  $-7 \div 1 = -7$  (viii)  $-3 \div 2 = -\frac{3}{2}$

**Question 10.**

Write the degree of each of the following polynomials :

(i)  $x + x^2$             (ii)  $5x^2 - 7x + 2$

(iii)  $x^3 - x^8 + x^{10}$             (iv)  $1 - 100x^{20}$

(v)  $4 + 4x - 4x^3$             (vi)  $8x^2y - 3y^2 + x^2y^5$

(vii)  $8z^3 - 8y^2z^3 + 7yz^5$

(viii)  $4y^2 - 3x^3 + y^2x^7$

**Solution:**

(i) 2

(ii) 2

(iii) 10

(iv) 20

(v) 3

(vi)  $8x^2y - 3y^2 + x^2y^5$

Sum of the powers of the term  $8x^2y = 2 + 1 = 3$

Sum of the powers of the term  $3y^2 = 2$

Sum of the powers of the term  $x^2y^5 = 2 + 5 = 7$

$\therefore$  The degree of given polynomial = 7.

(vii)  $8z^3 - 8y^2z^3 + 7yz^5$

Sum of the powers of the term  $8z^3 = 3$

Sum of the powers of the term  $8y^2z^3 = 2 + 3 = 5$

Sum of the powers of the term  $7yz^5 = 1 + 5 = 6$

$\therefore$  The degree of given polynomial = 6

(viii)  $4y^2 - 3x^3 + y^2x^7$

Sum of the powers of the term  $4y^2 = 2$

Sum of the powers of the term  $3x^3 = 3$

Sum of the powers of the term  $y^2x^7 = 2 + 7 = 9$

$\therefore$  The degree of given polynomial = 9

**REVISION EXERCISE**

**Question 1.**

Express each of the following statements in algebraic form :

- (i) The sum of  $3x$  and  $4y$  is  $8$ .
- (ii)  $5x$  decreased by  $7$  gives  $y$ .
- (iii)  $31$  added to  $4x$  gives  $6x$ .
- (iv)  $3x$  subtracted from  $89$  gives  $44$ .

**Solution:**

- (i)  $3x + 4y = 8$
- (ii)  $5x - 7 = y$
- (iii)  $4x + 37 = 6x$
- (iv)  $89 - 3x = 44$

**Question 2.**

Group the like terms :

- (i)  $7y, 3x, -8y, -x$  and  $\frac{x}{5}$
- (ii)  $3x^2, -5x^3, -x^2, 5x^2$  and  $8x^3$
- (iii)  $x^2y^3, -5x^3y^2, 8x^3y^2, -4x^2y^3$  and  $-x^2y^3$

**Solution:**

- (i)  $3x, -x, \frac{x}{5}$   
and  $7y, -8y$
- (ii)  $3x^2, -x^2, 5x^2$   
and  $-5x^3, 8x^3$
- (iii)  $x^2y^3, -4x^2y^3, -x^2y^3$   
and  $-5x^3y^2, 8x^3y^2$

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**Question 3.**

Write the number of terms in each of the following polynomials :

- (i)  $5 + 4x \div 2$       (ii)  $5 + 4x + 2y$
- (iii)  $8x^2 - 4x + 7$       (iv)  $\frac{x}{5} + \frac{x^2}{7} - \frac{x^3}{8} - \frac{1}{4}$
- (v)  $6x^2 \div x - 18 \div 9 + x^2$

**Solution:**

- (i) 2 terms
- (ii) 3 terms
- (iii) 3 terms
- (iv) 4 terms
- (v) 3 terms

**Question 4.**

For each expression, given below, state whether it is a monomial, or a binomial or a trinomial:

- (i)  $x + y$
- (ii)  $5x - 4y$
- (iii)  $7x^2 + 5x + 8$
- (iv)  $64 + 3 \div 6$
- (v)  $9 \div a \times b$
- (vi)  $8a \div b$

**Solution:**

- (i) binomial
- (ii) binomial
- (iii) trinomial

(iv)  $6a + 3 \div b = 6a + \frac{3}{b}$

It has two terms

It is binomial

(v)  $9 \div a \times b = \frac{9b}{a}$

It has one term

It is monomial.

- (vi) monomial

**Question 5.**

Write the coefficient of  $x^2y$  in :

- (i)  $-7x^2yz$
- (ii)  $8abx^2y$
- (iii)  $-x^2y$

**Solution:**

- (i)  $-7z$
- (ii)  $8ab$
- (iii)  $-1$

**Question 6.**

Write the coefficient of :

- (i)  $x^2$  in  $-8x^2y$
- (ii)  $y$  in  $-4y$
- (iii)  $x$  in  $-xy^2$

**Solution:**

- (i)  $-8y$
- (ii)  $-4$
- (iii)  $-y^2$

**Question 7.**

Write the numeral coefficient in :

(i)  $7x^2y$     (ii)  $\frac{2x}{3}$     (iii)  $-\frac{5}{4}xy^2z$

**Solution:**

(i) 7    (ii)  $\frac{2}{3}$     (iii)  $-\frac{5}{4}$

**Question 8.**

Write the degree of each of the following polynomials :

- (i)  $x^5 - 6x^8 + x$     (ii)  $4x^3 - x^4$   
 (iii)  $4 - x^2$     (iv)  $x - 1$   
 (v)  $x^2 + x - x^3$     (vi)  $x^3 - 8xy^2 + x^3y^3$   
 (vii)  $x^7 - 6y^4$     (viii)  $3y^3 - 2y^2z^4$   
 (ix)  $100x^8 - 8x^{100}$

**Solution:**

- (i) 8  
 (ii) 4  
 (iii) 2  
 (iv) 1  
 (v) 3

(vi)  $x^3 - 8xy^2 + x^3y^3$   
 sum of the power of term  $x^3 = 3$   
 sum of the power of term  $8xy^2 = 1 + 2 = 3$   
 sum of the power of term  $x^3y^3 = 3 + 3 = 6$   
 $x^3y^3 = 3 + 3 = 6$   
 $\therefore$  The degree of the given polynomial = 6.

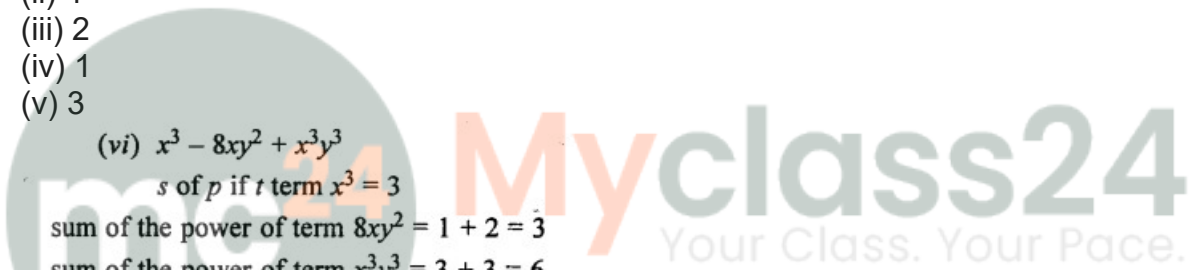
(vii)  $x^7 - 6y^4$   
 sum of the power of term  $x^7 = 7$   
 sum of the power of term  $6y^4 = 4$   
 $\therefore$  Degree of the given polynomial = 7.

(viii)  $3y^3 - 2y^2z^4$   
 sum of the power of term  $3y^3 = 3$   
 sum of the power of term  $2y^2z^4 = 2 + 4 = 6$   
 $\therefore$  Degree of the given polynomial = 6.

(ix)  $100x^8 - 8x^{100}$   
 sum of the power of term  $x^8 = 8$   
 sum of the power of term  $8x^{100} = 100$   
 $\therefore$  The degree of the given polynomial = 100.

**Question 9.**

Write each statement, given below in algebraic form :



- (i) 28 more than twice of  $x$  is equal to 45.
- (ii)  $3y$  reduced by  $5z$  is greater than  $8x$ .
- (iii)  $6x$  divided by  $13y$  is less than 17.
- (iv) 9 multiplied by  $5x$  is equal to  $2y$ .

**Solution:**

(i) 28 more than twice of  $x$  is equal to 45

i.e.  $2x + 28 = 45$

(ii)  $3y$  reduced by  $5z$  is greater than  $8x$

$3y - 5z > 8x$

(iii)  $6x$  divided by  $13y$  is less than 17 =  $\frac{6x}{13y} < 17$

(iv) 9 multiplied with  $5x$  is equal to  $2y$

$9 \times 5x = 2y$

**Question 10.**

State whether true or false :

- (i) If 23 is a constant and  $x$  is a variable,  $23 + x$  is constant.
- (ii) If 23 is a constant and  $x$  is a variable,  $23x$  is a variable.
- (iii) If  $y$  is a variable and 57 is a constant,  $y - 57$  is a variable.
- (iv) If  $3x$  and  $2y$  are variable; each of  $3x + 2y$ ,  $3x - 2y$ ,  $3x \div 2y$  and  $3x \times 2y$  is a variable.

**Solution:**

(i) False

Sum of a constant and a variable is also variable.

(ii) True

Product of a constant and a variable is variable.

(iii) True

Constant subtracted from a variable is also variable.

(iv) True

Sum, difference product or quotient of two variables is also variable.