EXERCISE 18(B)

1. Separate the constants and the variables from each of the following:
6, 4y, -3x, 5 / 4, (4 / 5)xy, az, 7p, 0, 9x / y, 3 / 4x, - xz / 3y
Solution:
6, 5 / 4and 0 are the constants
4y, -3x, (4 / 5)xy, az, 7p, 9x / y, 3 / 4x and – xz / 3y are the variables

2. Group the like terms together:
(i) 4x, -3y, -x, (2 / 3)x, (4 / 5)y and y.
(ii) (2 / 3) xy, -4yx, 2yz, (-2 / 3)yz, zy / 3 and yx.
(iii) $-ab^2$, b^2a^2, $7b^2a$, $-3a^2b^2$ and $2ab^2$
(iv) 5ax, -5by, by / 7, 7xa and 2ax / 3
Solution:
(i) 4x, -3y, -x, (2 / 3)x, (4 / 5)y and y.
Here, the like term are as follows
4x, -x, (2 / 3)x and -3y, (4 / 5)y, y
(ii) (2 / 3) xy, -4yx, 2yz, (-2 / 3)yz, zy / 3 and yx.
Here, the like terms are as follows
(2 / 3) xy, -4yx, yx and 2yz, (-2 / 3)yz, zy / 3
(iii) $-ab^2$, b^2a^2, $7b^2a$, $-3a^2b^2$ and $2ab^2$
Here, the like terms are as follows
$-ab^2$, $7b^2a$, $2ab^2$ and b^2a^2, $-3a^2b^2$
(iv) 5ax, -5by, by / 7, 7xa and 2ax / 3
Here, the like terms are as follows
5ax, 7xa, 2ax / 3 and – 5by, by / 7

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) 8 × 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) 16 is a constant and y is a variable but 16y is variable

The given statement is **true**

(ii) 5x has two terms 5 and x

The given statement is **false**

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

The given statement is **true**

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

The given statement is **false**

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

The given statement is **true**

(vi) 8 × ab is a binomial

The given statement is **false**

(vii) 8 + ab is a binomial

The given statement is **true**

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

The given statement is **true**

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

The given statement is **true**

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

The given statement is **false**

(xi) The coefficient of ab in –ab is -1

The given statement is **true**

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

The given statement is **false**

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

(i) 2a – b

(ii) 3 × x + a / 2

(iii) 3x – x / p

(iv) a ÷ x × b + c

(v) 3x ÷ 2 + y + 4

(vi) xy ÷ 2

(vii) x + y ÷ a

(viii) 2x + y + 8 ÷ y

(ix) 2 × a + 3 ÷ b + 4

Solution:

(i) 2a – b

The number of terms in given expression is two
(ii) $3 \times x + a / 2$
The number of terms in given expression is two
(iii) $3x - x / p$
The number of terms in given expression is two
(iv) $a \div x \times b + c$
The number of terms in given expression is two
(v) $3x \div 2 + y + 4$
The number of terms in given expression is three
(vi) $xy \div 2$
The number of terms in given expression is two
(vii) $x + y \div a$
The number of terms in given expression is two
(viii) $2x + y + 8 \div y$
The number of terms in given expression is three
(ix) $2 \times a + 3 \div b + 4$
The number of terms in given expression is three

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) xy and –yx are like terms
Yes, xy and –yx are like terms. Hence, the given statement is **true**
(ii) x^2y and $–y^2x$ are like terms
No, x^2y and $–y^2x$ are not like terms. Hence, the given statement is **false**
(iii) a and –a are like terms.
Yes, a and –a are like terms. Hence, the given statement is **true**
(iv) –ba and 2ab are unlike terms.
No, –ba and 2ab are like terms. Hence, the given statement is **false**
(v) 5 and 5x are like terms.
No, 5 and 5x are not like terms. Hence, the given statement is **false**
(vi) 3xy and 4xyz are unlike terms.
Yes, 3xy and 4xyz are unlike terms. Hence, the given statement is **true**

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 ÷ y

(iv) –a

(v) $ax^2 – x + 5$

(vi) -3bc + d

(vii) 1 + x + y

(viii) 1 + x ÷ y

(ix) $x + xy – y^2$

Solution:

(i) xy

Here xy has one term

Therefore, xy is a **monomial**

(ii) xy + x

Here xy + x has two terms

Therefore, xy + x is a **binomial**

(iii) 2x ÷ y

Here 2x ÷ y has one term

Therefore, 2x ÷ y is **monomial**

(iv) –a

Here –a has one term

Therefore, –a is a **monomial**

(v) $ax^2 – x + 5$

Here $ax^2 – x + 5$ has three terms

Therefore, $ax^2 – x + 5$ is a **trinomial**

(vi) -3bc + d

Here -3bc + d has two terms

Therefore, -3bc + d is a **binomial**

(vii) 1 + x + y

Here 1 + x + y has three terms

Therefore, 1 + x + y is a **trinomial**

(viii) 1 + x ÷ y

Here 1 + x ÷ y has two terms

Therefore, 1 + x ÷ y is a **binomial**

(ix) $x + xy – y^2$

Here $x + xy – y^2$ has three terms

Therefore, $x + xy – y^2$ is a **trinomial**

7. Write down the coefficient of x in the following monomial:
(i) x
(ii) –x
(iii) -3x
(iv) -5ax
(v) 3 / 2 xy
(vi) ax / y
Solution:
(i) x
The coefficient of x in the given monomial x is 1
(ii) – x
The coefficient of x in the given monomial –x is -1
(iii) -3x
The coefficient of x in the given monomial -3x is -3
(iv) -5ax
The coefficient of x in the given monomial -5ax is -5a
(v) 3 / 2 xy
The coefficient of x in the given monomial is (3 / 2)y
(vi) ax / y
The coefficient of x in the given monomial is (a / y)

8. Write the coefficient of:
(i) x in $-3xy^2$
(ii) x in –ax
(iii) y in –y
(iv) y in (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) x in $-3xy^2$
- $3y^2$ is the coefficient of x in $-3xy^2$
(ii) x in –ax
- a is the coefficient of x in –ax
(iii) y in –y
-1 is the coefficient of y in –y
(iv) y in (2 / a)y
(2 / a) is the coefficient of y in (2 / a)y

(v) xy in -2xyz
- 2z is the coefficient of xy in -2xyz
(vi) ax in $–axy^2$
- y^2 is the coefficient of ax in $–axy^2$
(vii) x^2y in $-3ax^2y$
- 3a is the coefficient of x^2y in $-3ax^2y$
(viii) xy^2 in $5axy^2$
5a is the coefficient of xy^2 in $5axy^2$

9. State the numeral coefficient of the following monomials:
(i) 5xy
(ii) abc
(iii) 5pqr
(iv) -2x / y
(v) (2 / 3) xy^2
(vi) -15xy / 2z
(vii) -7x ÷ y
(viii) -3x ÷ (2y)
Solution:
(i) 5xy
The numeral coefficient of the given monomial is 5
(ii) abc
The numeral coefficient of the given monomial is 1
(iii) 5pqr
The numeral coefficient of the given monomial is 5
(iv) -2x / y
The numeral coefficient of the given monomial is -2
(v) (2 / 3) xy^2
The numeral coefficient of the given monomial is (2 / 3)
(vi) -15xy / 2z
The numeral coefficient of the given monomial is (-15 / 2)
(vii) -7x ÷ y
The numeral coefficient of the given monomial is -7 ÷ 1 = -7
(viii) -3x ÷ (2y)
The numeral coefficient of the given monomial is -3 ÷ 2 i.e. (-3 / 2)

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) $x + x^2$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $x + x^2$ is 2
(ii) $5x^2 – 7x + 2$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $5x^2 – 7x + 2$ is 2
(iii) $x^3 – x^8 + x^{10}$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $x^3 – x^8 + x^{10}$ is 10
(iv) $1 – 100x^{20}$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $1 – 100x^{20}$ is 20
(v) $4 + 4x – 4x^3$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $4 + 4x – 4x^3$ is 3
(vi) $8x^2y – 3y^2 + x^2y^5$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $8x^2y – 3y^2 + x^2y^5$ is 7
(vii) $8z^3 – 8y^2z^3 + 7yz^5$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $8z^3 – 8y^2z^3 + 7yz^5$ is 6

(viii) $4y^2 – 3x^3 + y^2x^7$

The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial

Therefore, the degree of the given polynomial $4y^2 – 3x^3 + y^2x^7$ is 9