Important Questions for Class 9 Maths

Chapter 2- Polynomials

Multiple Choice Questions (MCQs) from Chapter 2: Polynomials for Class 9 Maths

1. Which of the following is the degree of the polynomial $5x^4 - 3x^3 + x - 6$?

a) 4
b) 3
c) 1
d) 2

Answer: a) 4

2. What is the factorization of $x^2 + 5x + 6$?

a) (x+3)(x+2)
b)(x+1)(x+6)
c) (x−1)(x+6)
d) (x−3)(x−2)

Answer: a)(x+3)(x+2)

3. Which of the following is not a polynomial?

a) x^3+4x^2-2x+1
b) $5x^4-3x+2$
c) $x\frac{1}{x}+3x$

d) $7x^2-3x+4$

Answer: c) $x\frac{1}{x}+3x$

4. If x+2 is a factor of the polynomial x^2+3x+k, then the value of k is:

a) -6
b) 4
c) -4
d) 6

Answer: c) -4

5. The zeros of the polynomial x^2-5x+6 are:

a) 2 and 3
b) -2 and -3
c) 1 and 6
d) -1 and -6

Answer: a) 2 and 3

6. What is the value of p(3) for the polynomial $p(x) = 4x^2 - 3x + 7$?

a) 30
b) 24
c) 27
d) 40

Answer: b) 24

7. Which of the following is the factorization of $x^2 - 16$?

a) (x−4)(x+4)
b) (x−2)(x+8)
c) (x−8)(x+2)
d) (x−1)(x+16)

Answer: a) (x−4)(x+4)

8. If x=−3 is a root of the polynomial $x^2 + 6x + 9$, then the factor is:

a) x+3

b) x−3
c) x+6
d) x−9

Answer: a) x+3

9. What is the remainder when $x^3 - 4x^2 + 2$ is divided by x−2?

a) -8
b) -12
c) 0
d) 12

Answer: b) -12

10. Which of the following is a polynomial of degree 3?

a) $x^4 - 2x^3 + 3x^2 - x + 2$
b) $x^3 + 2x - 5$
c) $5x^2 + 4x - 3$
d) $x^2 + 2x + 1$

Answer: b) $x^3 + 2x - 5$

11. Which of the following expressions is not a polynomial?

a) $5x^2 - 3x + 1$
b) $x^2 + 1$
c) $\frac{1}{x}$
d) $x^3 + 2x^2 + 7$

Answer: c) $\frac{1}{x}$

12. What is the factor of the polynomial $x^2+7x+12$?

a) (x+3)(x+4)
b) (x+2)(x+6)
c) (x−3)(x−4)
d) (x+1)(x+12)

Answer: a) (x+3)(x+4)

13. Which of the following polynomials is a binomial?

a) x^2+3x+2
b) 4x−7
c) $3x^3+2x-1$
d) x^2+2x+1

Answer: b) 4x−7

14. What is the constant term in the polynomial $2x^3+4x^2-3x+5$?

a) 4
b) -3
c) 5
d) 2

Answer: c) 5

15. If $p(x)=3x^2-5x+2$, what is the value of p(2)?

a) 4
b) 5
c) 6
d) 3

Answer: a) 4

Important Questions

1. What is the difference between a polynomial and a rational expression?

Answer: A polynomial is an algebraic expression involving sums and products of variables raised to non-negative integer powers with constant coefficients, whereas a rational expression is a ratio of two polynomials. A rational expression can involve division by a polynomial, whereas a polynomial cannot have division by a variable.

2. Verify if x - 2 is a factor of x^2-4x+4.

Answer: To verify if x−2 is a factor, divide x^2-4x+4 by x−2. If the remainder is zero, then x−2 is a factor.

- Factorize x^2-4x+4 as (x-2)(x-2).
- Since x-2 is a factor, the verification is successful.

3. Find the value of k if x+3 is a factor of $x^2+kx-18$.

Answer: Use the Factor Theorem. If x+3 is a factor, then x=-3 should satisfy the equation.

Substitute x=-3 into $x^2+kx-18$:

$(-3)^2+k(-3)-18=0(-3)$

$9-3k-18=0$

$\Rightarrow -3k=9$

$\Rightarrow k=-3$

4. What are the coefficients of the polynomial $4x^3+2x^2-5x+6$?

Answer: The coefficients of the polynomial $x^3+2x^2-5x+64$ are:

- Coefficient of $x^3=4$
- Coefficient of $x^2=2$
- Coefficient of x= -5
- Constant term = 6

5. Find the value of a if the polynomial $2x^2+ax+5$ has a factor of x+1.

Answer: By the Factor Theorem, if x+1 is a factor, then $x=-1$ should satisfy the equation $2x^2+ax+5=0$.

Substitute $x=-1$ into $2x^2+ax+5$:

$2(-1)^2 + a(-1) + 5 = 0$

$2 - a + 5 = 0$

$-a+7=0$

$\Rightarrow a=7$

6. Find the factorization of $x^2 - 10x + 21$

Answer: To factorize $x^2 - 10x + 21$, find two numbers that multiply to 21 and add to -10. The numbers are -3 and -7.

Therefore, the factorization is: $x^2 - 10x + 21 = (x-3)(x-7)$

7. If $p(x) = 3x^2 - 5x + 2$**, find p(2).**

Answer: Substitute x=2 into $p(x) = 3x^2 - 5x + 2$:

$p(2) = 3(2)^2 - 5(2) + 2 = 3(4) - 10 + 2 = 12 - 10 + 2 = 4$

So, p(2)=4

8. Find the remainder when $x^3 - 4x^2 + 2x - 8$ **is divided by x-2.**

Answer: Using the Remainder Theorem, substitute x=2 into the polynomial $x^3 - 4x^2 + 2x - 8$:

$2^3 - 4(2^2) + 2(2) - 8 = 8 - 16 + 4 - 8 = -12$ So, the remainder is -12.

9. Explain the concept of the degree of a polynomial and find the degree of the polynomial $5x^4 - 3x^3 + x - 6$.

Answer: The degree of a polynomial is the highest power of the variable in the polynomial.

For $x^4 - 3x^3 + x - 6$, the highest power of x is 4.

Therefore, the degree of the polynomial is **4**.

10. Is $x^3 + 2x^2 - 5x + 4$ a polynomial? Justify your answer.

Answer: Yes, $x^3 + 2x^2 - 5x + 4$ is a polynomial because it is an expression in which the exponents of xxx are non-negative integers (3, 2, 1, and 0), and it contains no division by a variable or negative exponents.

11. Solve for the zeros of $x^2 + 6x + 9$.

Answer: The polynomial $x^2 + 6x + 9$ can be factored as:

$$x^2 + 6x + 9 = (x + 3)(x + 3) = (x + 3)^2$$

Therefore, the only zero of the polynomial is x=−3.

12. Find the value of the polynomial $3x^2 + 4x - 5$ at x=−2.

Answer: Substitute x=−2 into the polynomial $x^2 + 4x - 5$:

$$3(-2)^2 + 4(-2) - 5 = 3(4) - 8 - 5 = 12 - 8 - 5 = -1$$

Therefore, the value is −1.

13. How do you check whether x−1 is a factor of x^2-3x+2?

Answer: To check whether x−1 is a factor of x^2-3x+2, substitute x=1 into the polynomial.

$1^2-3(1)+2=1-3+2=0$ Since the result is zero, x−1 is indeed a factor of the polynomial.

14. Factorize x^2-16.

Answer: x^2-16 is a difference of squares, and can be factorized as: $x^2-16=(x-4)(x+4)$

15. What is the constant term in the polynomial $5x^2-4x+7$?

Answer: The constant term in the polynomial $5x^2-4x+7$ is 7.