QB365

Important Questions - Polynomials

9th Standard CBSE

Mathematics

Reg.No. :

Time : 01:00:00 Hrs

Total Marks : 50

Section-A

1) Which of the following is an algebraic identity? **1**

(a) $(x+y)^2=x^2-2xy+y^2$ (b) $(x+y)^2=x^2+2xy-y^2$ (c) $(x+y)^2=x^2+2xy+y^2$ (d) $(x+y)^2=-x^2+2xy+y^2$

2) The number 0 is called a **1**

(a) zero polynomial (b) binomial (c) trinomial (d) linear polynomial

3) Which of the following is a polynomial? **1**

(a) $x^2+x+\frac{3}{x^2}$ (b) $\sqrt{x}+5$ (c) $x^{3/4}-7x+4$ (d) $\frac{3}{2}x^3-\frac{4}{3}x^2+2x-1$

4) $y+\frac{1}{y}$ is: **1**

(a) polynomial of degree 1 (b) polynomial of degree 2 (c) polynomial of degree 3 (d) Not a polynomial

5) The degree of the polynomial p(x)=3 is: **1**

(a) 3 (b) 1 (c) 0 (d) 2

6) Degree of polynomial $(x^3+5)(4-x^5)$ is: **1**

(a) 0 (b) 5 (c) 3 (d) 2

7) What is remainder when x^3-2x^2+x+1 is divided by (x-1)? **1**

(a) 0 (b) -1 (c) 1 (d) 2

8) (x+2) is a factor of $2x^3+5x^2-x-k$. The value of k is: **1**

(a) 6 (b) -24 (c) -6 (d) 24

9) If $2(a^2+b^2)=(a+b)^2$ then **1**

(a) a=2b (b) b=2a (c) a=b (d) a+b=0

10) If $x+\frac{1}{x}=4$ then the value of $x^2+\frac{1}{x^2}$ is: **1**

(a) 18 (b) 14 (c) 16 (d) 20

Section-B

11) $1+x^2+x^4-x-x^3$ **2**

12) $2x^3-7x+x^2+3x^4$ **2**

13) $\frac{x}{2}-\frac{x^2}{3}+\frac{x^3}{4}$ **2**

14) $2-y^2-y^3+2y^8$ **2**

15) Check whether the polynomial $q(t)=4t^3+4t^2-t-1$is divided by x+1 **2**

16) Polynomials kx^3+3x^2-3 and $2x^3-5x+k$, when divided by (x-4) leave the same remainder in each case. Find the value of k. **2**

17) If $x^3-5x^2-px+25=(x-4)q(x)$ then what is the value of p? **2**

18) If $x^2-3x+2$is a factor of the polynomial x^4-ax^3+b then find the values of a and b. **2**

19) Factorise: x^3-3x^2-9x-5 **2**

20) Factorise: $16x^3 - 2y^3$ **2**

Section-C

21) $5y^2 - 3y + 2$ **5**

22) The polynomial $p(x) = 2x^3 - 3x^2 + ax - 3a + 9$when divided by x+1, leaves the remainder 16. Find the value of a. Also, find the remainder when p(x) is divided by x+2. **5**

23) Evaluate 105 x 93 without multiplying directly. **5**

24) Prove that $(a+b)^3 + (b+c)^3 + (c+a)^3 - 3(a+b)(b+c)(c+a)$=$2(a^3 + b^3 + c^3 - 3abc)$ **5**

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Section-A

1) (c) $(x+y)^2 = x^2 + 2xy + y^2$ **1**

2) (a) zero polynomial **1**

3) (d) $\frac{3}{2}x^3 - \frac{4}{3}x^2 + 2x - 1$ **1**

4) (d) Not a polynomial **1**

5) (c) 0 **1**

6) (b) 5 **1**

7) (c) 1 **1**

8) (a) 6 **1**

9) (c) a=b **1**

10) (b) 14 **1**

Section-B

11) -1 **2**

12) 2 **2**

13) $\frac{1}{4}$ **2**

14) 8 **2**

15) Yes **2**

16) 1 **2**

17) 2 **2**

18) a=$\frac{15}{7}$, b=$\frac{8}{7}$ **2**

19) (x+1)(x+1)(x-5) **2**

20) $2(2x - y)(4x^2 + 2xy + y^2)$ **2**

Section-C

21) 5, -3, 2 **5**

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22) $p(x) = 2x^3 - 3x^2 + ax - 3a + 9$ **5**

By remainder theorem,

$p(-1) = 16 \quad | \quad x+1=0 \quad \Rightarrow x = -1$

$\Rightarrow \quad 2(-1)^3 - 3(-1)^2 + a(-1) - 3a + 9 = 16$

$\Rightarrow \quad -2 - 3 - a - 3a + 9 = 16$

$\Rightarrow \quad 4a = -12$

$\Rightarrow \quad a = -3$

$\therefore \quad p(x) = 2x^3 - 3x^2 - 3x - 3 \quad \times \quad (-3) + 9$

$= 2x^3 - 3x^2 - 3x + 18$

$\therefore$ Remainder when p(x) is divided by x+2 =p(-2)

| By remainder theorem: $x + 2 = 0 \Rightarrow x = -2$

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

$= -16 - 12 + 6 + 18 = -4$

23) 105 x 93 **5**

=(100+5) x (100 x7)

=(100+5) x {100+(-7)}

=$(100)^2$+{5+(-7)}(100)+(5)(-7) | Using Identity IV

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24) **5**

L.H.S=$(a+b)^3 + (b+c)^3 + (c+a)^3 - 3(a+b)(b+c)(c+a)$

$= \{(a+b) + (b+c) + (c+a)\}\,[(a+b)^2 + (b+c)^2 + (c+a)^2 - (a+b)(b+c - (b_c)(c+a) - (c+a)(a+b)]$

$= 2(a+b+c)[a^2 + 2ab + b^2 + b^2 + 2bc + c^2 + c^2 + 2ca + c^2 - ab - ac - b^2 - bc - bc - ba - c^2 - ca - ca - cb - a^2 - ab]$

| Using Identity I

$= 2(a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)$

$= 2(a^3 + b^3 + c^3 - 3abc)$ | Using Identity VIII

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