



INDIAN SCHOOL AL WADI AL KABIR

Class IX Mathematics

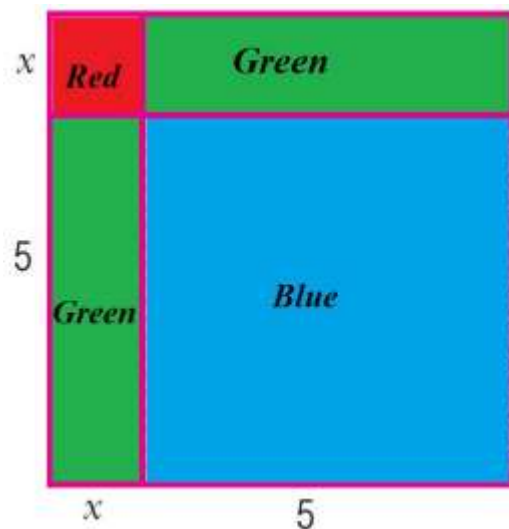
Worksheet – Polynomials (2025-26)

Questions of 1 mark each

Q1.	The coefficient of x in the expansion $(x + 3)^3$			
	A) 9	B) 1	C) 27	D) 18
Q2	The remainder when $4x^3 - 12x^2 + 14x - 3$ is divided by $x - 12$			
	A) $-\frac{2}{3}$	B) $\frac{2}{3}$	C) $\frac{3}{2}$	D) $-\frac{3}{2}$
Q3.	The value of the polynomial $x^2 - 3x + 5$ at $x = 2$ is			
	A) 3	B) 2	C) 1	D) 0
<p>ASSERTION AND REASONING</p> <p>DIRECTION: A statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.</p> <p>(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).</p> <p>(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).</p> <p>(c) Assertion (A) is true but Reason (R) is false.</p> <p>(d) Assertion (A) is false but Reason (R) is true.</p>				
Q4.	<p>Assertion: $(x + 2)$ is a factor of $x^3 + 3x^2 + 5x + 6$ and of $2x + 4$</p> <p>Reason: If $p(x)$ be a polynomial of degree greater than or equal to one, then $(x - a)$ is a factor of $p(x)$, if $p(a) = 0$</p>			
Q5.	<p>Assertion: -2 is a constant polynomial.</p> <p>Reason: Degree of a constant polynomial is zero.</p>			

Q6	If $p(x) = 5x^2 - 3x + 2$, then $p(1) + p(-1) - p(0)$.			
	A) 0	B) 10	C) 8	D) 12
Q7	$(x + 1)$ is a factor of which of the given polynomial			
	A) $x^3 + x^2 + x - 1$	B) $x^3 + x^2 + x + 3$	C) $x^3 + x^2 + x + 1$	D) None of these
Q8	Which of the following is NOT a Polynomial?			
	A) $x^3 + 3x^2 + 5x + 6$	B) $3x^2 + 5\frac{x}{\sqrt{x}} + 6$	C) $5x + 6$	D) 6
Q9	The value of $\frac{2.7 \times 2.7 \times 2.7 - 1.3 \times 1.3 \times 1.3}{2.7 \times 2.7 + 2.7 \times 1.3 + 1.3 \times 1.3}$			
	A) 5.4	B) -1.4	C) 1.4	D) 1
Q10	The value of 98^2 is			
	A) 9204	B) 10404	C) 9604	D) 9804
	Questions of 2 marks each			
Q11	Simplify: $\left(x + \frac{1}{x}\right)\left(x - \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2}\right)$			
Q12	Factorize: $25x^2 - \frac{49}{36}y^2$			
Q13	If $x + y = 8$ and $xy = 15$, find the value of $x^3 + y^3$			
Q14	Find the value of k if $(x - 2)$ is a factor of $x^3 - 2kx^2 + kx - 6$.			
	Questions of 3 marks each			
Q15	Write the following cubes in expanded form: (a) $(3a + 4b)^3$ (b) $(3a + 2b + c)^2$			
Q16	Factorize completely $2x^3 - 9x^2 + 10x - 3$			
Q17	If $x^3 + ax^2 - bx + 10$ is divisible by $x^2 - 3x + 2$, find the values of a and b.			

Case study (4 Marks)	
Q18	<p>Lakshmi and Vivek participated in a mathematics quiz competition. In one of the mental math rounds, they were asked to solve problems involving sum of cubes without using a calculator. They recalled an important algebraic identity related to cubes:</p> $x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$ <p>Using this identity, they were able to answer all the questions quickly.</p> <ol style="list-style-type: none"> Without finding the actual cubes, find $15^3 + (-8)^3 + (-7)^3$ If $x + y + z = 0$, show that $x^3 + y^3 + z^3 = 3xyz$. Factorize: $27x^3 + y^3 + z^3 - 9xyz$
Q19	<p>Mahesh formed a square using four pieces of origami, as shown in the figure.</p> <p>Based on above information answer the following questions.</p> <ol style="list-style-type: none"> what will be the side of the square obtained by joining all four pieces? What is total the area of the squares colored in red and blue? If $p(y) = y^2 - 2y + 1$, then find the value of $p(y) + p(-y)$. What is the degree of the trinomial $x^3 + 2x^2 + 3x$?
Questions of 5 marks each	
Q20	<p>If $x - \frac{1}{x} = 4$, find</p> <ol style="list-style-type: none"> $x^2 + \frac{1}{x^2}$ $x^4 + \frac{1}{x^4}$
Q21	<ol style="list-style-type: none"> What are the possible expressions for the length and breadth of the rectangle if area $A(x) = 9x^2 - 9x + 2$ What are the possible expressions for the dimensions of the cuboids whose volume is $V(x) = x^4 - 64x$



ANSWER KEY										
	Q1	(C)	Q2	(C)	Q3	(A)	Q4	(A)	Q5	(A)
	Q6	(D)	Q7	(C)	Q8	(B)	Q9	(C)	Q10	(C)
	Q11	$x^4 - \frac{1}{x^4}$	Q12	$(5x + \frac{7}{6}y)(5x - \frac{7}{6}y)$	Q13	152	Q14	$\frac{1}{3}$		
	Q15	(a) $27a^3+108a^2b+144ab^2+64b^3$ (b) $9a^2 + 4b^2 + c^2 + 12ab + 6ac + 4bc$			Q16	$(x - 1) (2x - 1) (x - 3)$				
	Q17	2 and 3	Q18	i) 2520 ii)LHS=RHS iii) $(3x+y+z) (9x^2+y^2+z^2-3xy-yz-3xz)$			Q19	a) $x + 5$ b) x^2+25 c) $2y^2 + 2$ d) 3		
	Q20	i) 6 ii) 38	Q21	a) length = $3x - \sqrt{2}$, breadth = $3x + \sqrt{2}$ b) length = $x - 4$, breadth = $x^2 + 4x + 16$, height = x						