



Time: 1 hr 20 min.

M.M. : 30

General Instructions:-

I. All questions are compulsory.

Q.No.	Section-A	Marks
1	If the decimal representation of a rational number is- (a) Non Terminating (b) Terminating or non terminating repeating (c) Non Terminating non repeating (d) None of these	1
2	Which of the following is not a polynomial? a) $2x^2-x$ (b) $3x^3-(\sqrt{x})^2+1$ (c) $x+\sqrt{5}x^2$ (d) $(x+1)/x$	
3	The perpendicular distance of a point P (8,-5) from the x-axis is: (a) 5 (b) 8 (c) 3 (d) 13	1
4	Assertion: There are infinite number of lines which passes through (3, 2). Reason: A linear equation in two variables has infinitely many solutions. (a) Both Assertion (A) & Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A). (b) Both Assertion (A) & Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.	1
5	The value of $p(x) = 4x^2+3x-2$ at $x = 1$, is: (a)5 (b)10 (c)-6 (d)6	
Section-B		
6	Write any two postulates.	2
7	Express $4.77777\dots$ in the form of p/q.	2
8	prove that $x^3+y^3=(x+y)(x^2+y^2-xy)$	2
9	If $(x-2)$ is a factor of $3x^2-kx+1$. Then find the value of k?	
10	The cost of a pen is 5 less than the cost of a notebook. Express this situation in the form of linear equation in two variables?	
Section-C		
11	Find three solution of the given equation $3x+y=3$.	3
12	Factorise : x^3+2x^2-x-2	3
13	Write the answer to each of the following questions: (i) What is the name of the horizontal and the vertical lines drawn, to determine the position of any point in the Cartesian plane? (ii) What is the name of each part of the plane formed by these two lines? (iii) Find the distance between point $(-2,0)$ and $(3,0)$.	3
14	If $[(\sqrt{5})/(2+\sqrt{5})]=a+b\sqrt{5}$. Then find the value of a and b.	3
15	Evaluate: (i) $(2a-3b)^3$ (ii) $(2x-y+z)^2$	3



Time: 1 hr 20 min.

M.M. : 30

General Instructions:-

I. All questions are compulsory.

Q.No.	Section-A	Marks
1	If the decimal representation of a number is non-terminating and non-repeating then the number is- (a) a natural number (b) a rational number (c) a whole number (d) an irrational number	1
2	Which of the following is a polynomial? a) $2x^2 - \sqrt{x}$ (b) $3x^3 - (x)^{2/3} + 1$ (c) $x + \sqrt{5}x^2$ d) $(x+1)/x$	
3	The perpendicular distance of a point P (5, 8) from the y-axis is: (a) 5 (b) 8 (c) 3 (d) 13	1
4	Assertion: There are infinite number of lines which passes through (3, 2). Reason: A linear equation in two variables has infinitely many solutions. (a) Both Assertion (A) & Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A). (b) Both Assertion (A) & Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.	1
5	The value of $p(x) = 5x - 4x^2 + 3$ at $x = -1$, is: (a)3 (b)- (c)-6 (d)6	
	Section-B	
6	Write any two axioms.	2
7	Express $2.77777\dots$ in the form of p/q.	2
8	If $x+y+z=0$, then prove that $x^3+y^3+z^3=3xyz$	2
9	If $(x+3)$ is a factor of $2x^2-kx+3$. Then find the value of k?	
10	The cost of a pen is 10 more than the cost of a notebook. Express this situation in the form of linear equation in two variables?	
	Section-C	
11	Find three solution of the given equation $x+2y=3$.	3
12	Factorise : $x^3 - 6x^2 + 11x - 6$.	3
13	Write the answer to each of the following questions: (i) What is the name of the horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane? (ii) What is the name of each part of the plane formed by these two lines? (iii) Find the distance between point (0, -3) and (0, 4).	3
14	If $[(\sqrt{3}) / (2+\sqrt{3})] = a+b\sqrt{3}$. Then find the value of a and b.	3
15	Evaluate: (i) $(2a-3b+c)^2$ (ii) $(2x-5)^3$	3



OSDAV Public School, Kaithal

Answer key (PT-2)

Class : ixth

Subject : Maths(Set A)

Q.No.	Section-A	Marks
1	(d) irrational number	1
2	c) $x + \sqrt{5x^2}$	1
3	(a) 5 units	1
4	(b)	1
5	c) -6	1
	Section-B	
6	Any two axioms	2
7	<p>Let $x = 2.77\text{---}$ ① multiply by 10 both sides - $10x = 27.77\text{---} \times 10$ $10x = 27.77\text{---}$ ② Subtracting Equ. ① from Equ. ② $10x = 27.77\text{---}$ $- x = 2.77\text{---}$ <hr/> $9x = 25$ $x = \frac{25}{9}$ $2.\bar{7} = \frac{25}{9}$</p>	<p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p>
8	<p>Solution</p> <p>$\therefore x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$</p> <p>Also it is given $x + y + z = 0$</p> <p>$\Rightarrow x^3 + y^3 + z^3 - 3xyz = (0)(x^2 + y^2 + z^2 - xy - yz - zx)$</p> <p>$\Rightarrow x^3 + y^3 + z^3 - 3xyz = 0$</p> <p>$\Rightarrow x^3 + y^3 + z^3 = 3xyz$</p>	<p>1</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p>
9	<p>Put $x+3=0$ $x=-3$ $(x+3)$ is a factor of $2x^2-kx+3$</p>	$\frac{1}{2}$

	<p>So $P(-3) = 0$ $2(-3)^2 - k(-3) + 3 = 0$ $k = -7$</p>	<p>$\frac{1}{2}$ 1</p>
10	<p>Let the cost of 1 pen = x rs. The cost of 1 notebook = y rs. A. T. Q. $x - y = 10$.</p>	<p>$\frac{1}{2}$ $\frac{1}{2}$ 1</p>
Section-C		
11	Any three solutions.	1+1+1
12	<p>For $x = 1$, the value of the given expression becomes: $p(1) = 1^3 - 6 \times 1^2 + 11 \times 1 - 6 = 0$ By factor theorem, $(x + 1)$ is a factor of $x^3 - 6x^2 + 11x - 6$.</p> <p>Performing long division as shown below:</p> $ \begin{array}{r} x^2 - 5x + 6 \\ x - 1 \overline{) x^3 - 6x^2 + 11x - 6} \\ \underline{x^3 - x^2} \\ -5x^2 + 11x - 6 \\ \underline{-5x^2 + 5x} \\ 6x - 6 \\ \underline{6x - 6} \\ 0 \end{array} $ <p>We get the quotient: $q(x) = x^2 - 5x + 6$ $= x^2 - 2x - 3x + 6$ $= x(x - 2) - 3(x - 2)$ $= (x - 3)(x - 2)$</p> <p>Polynomial $p(x)$ can be written as: $p(x) = (x - 1)q(x)$ $p(x) = (x - 1)(x - 2)(x - 3)$</p>	<p>$\frac{1}{2}$ 1 1 $\frac{1}{2}$</p>
13	<p>1) Horizontal line- x-axis Vertical line - y-axis</p> <p>ii) Quadrant</p> <p>iii) 7 units</p>	<p>$\frac{1}{2} + \frac{1}{2}$ 1 1</p>

$$\text{if } \frac{\sqrt{3}}{2+\sqrt{3}} = a + b\sqrt{3}$$

$$\frac{\sqrt{3}}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}} = a + b\sqrt{3}$$

$$\frac{2\sqrt{3} - 3}{4 - 3} = a + b\sqrt{3}$$

$$2\sqrt{3} - 3 = a + b\sqrt{3}$$

$$-3 + 2\sqrt{3} = a + b\sqrt{3}$$

on Comparing -

$$a = -3$$

$$b = 2.$$

1

1

 $\frac{1}{2} + \frac{1}{2}$

$$(i) (2a - 3b + c)^2$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca \quad \frac{1}{2}$$

$$(2a + c - 3b)^2 = (2a)^2 + (c)^2 + (-3b)^2 + 2(2a)(c) + 2(c)(-3b) + 2(-3b)(2a)$$

$$= 4a^2 + c^2 + 9b^2 + 4ac - 6cb - 6b(2a) \quad \frac{1}{2}$$

$$= 4a^2 + 9b^2 + c^2 - 12ab - 6bc + 4ac \quad \frac{1}{2}$$

$$(ii) (2x - 5)^3$$

$$(a - b)^3 = a^3 - b^3 - 3a^2b + 3b^2a \quad \frac{1}{2}$$

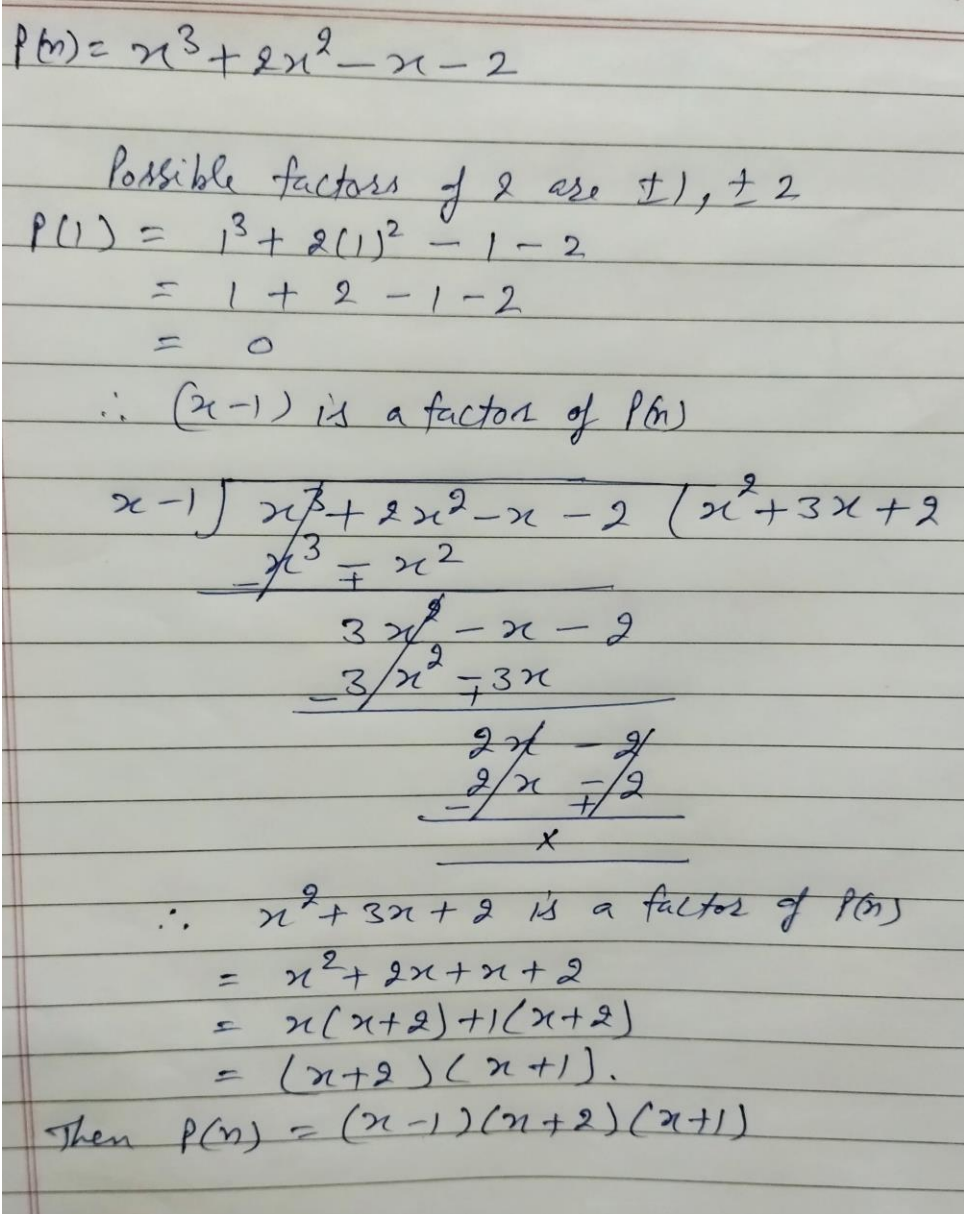
$$(2x - 5)^3 = (2x)^3 - (5)^3 - 3(2x)^2(5) + 3(5)^2(2x) \quad \frac{1}{2}$$

$$= 8x^3 - 125 - 60x^2 + 150x$$

$$= 8x^3 - 60x^2 + 150x - 125 \quad \frac{1}{2}$$



Q.No.	Section-A	Marks
1	(b) Terminating or non terminating repeating	1
2	d) $(x+1)/x$	1
3	c) 5 units	1
4	(b)	1
5	c) 5	1
	Section-B	
6	Any two axioms	2
7	<p>Let $x = 4.77\text{---}$ ———— ①</p> <p>Multiplying by 10 both sides</p> <p>$10x = 4.77\text{---} \times 10$</p> <p>$10x = 47.77\text{---}$ ————</p> <p>Subtract Eqn ① from Eqn ②</p> <p>$10x = 47.77\text{---}$ ———— ①</p> <p>$x = 4.77\text{---}$ ———— ②</p> <hr/> <p>$9x = 43$</p> <p>$x = \frac{43}{9}$</p>	<p>½</p> <p>½</p> <p>½</p> <p>½</p>
8	<p>Solution</p> <p>Q). Verify that $x^3 + y^3 = (x+y)(x^2 - xy + y^2)$</p> <p>1). R.H.S $\Rightarrow (x+y)(x^2 - xy + y^2)$</p> <p>$\Rightarrow x^3 - x^2y + xy^2 + x^2y - xy^2 + y^3$ {On multiplying $x^3 + y^3$ with $(x+y)(x^2 - xy + y^2)$}</p> <p>$\Rightarrow [x^3 + y^3] + (-x^2y + x^2y) + (xy^2 - xy^2)$</p> <p>$\Rightarrow x^3 + y^3$</p> <p>Since R.H.S = L.H.S,</p> <p>That is $x^3 + y^3 = x^3 + y^3$</p> <p>Hence, verified that $x^3 + y^3 = (x+y)(x^2 - xy + y^2)$</p>	<p>1</p> <p>1</p>

9	Put $x-2=0$ $x=2$ $(x-2)$ is a factor of $3x^2-kx+1$ So $P(2)=0$ $3(2)^2-k(2)+1=0$ $K=13/2$	$\frac{1}{2}$ $\frac{1}{2}$ 1
10	Let the cost of 1 pen= x rs. The cost of 1 notebook= y rs. A. T. Q. $x+5=y$ $x-y+5=0$	$\frac{1}{2}$ $\frac{1}{2}$ 1
Section-C		
11	Any three solutions.	1+1+1
12	 <p> $P(x) = x^3 + 2x^2 - x - 2$ Possible factors of 2 are $\pm 1, \pm 2$ $P(1) = 1^3 + 2(1)^2 - 1 - 2$ $= 1 + 2 - 1 - 2$ $= 0$ $\therefore (x-1)$ is a factor of $P(x)$ $\begin{array}{r} x-1 \overline{) x^3 + 2x^2 - x - 2} \\ \underline{x^3 - x - 2} \\ 3x^2 - x - 2 \\ \underline{-3x^2 + 3x} \\ 2x - 2 \\ \underline{-2x + 2} \\ x \end{array}$ $\therefore x^2 + 3x + 2$ is a factor of $P(x)$ $= x^2 + 2x + x + 2$ $= x(x+2) + 1(x+2)$ $= (x+2)(x+1)$ Then $P(x) = (x-1)(x+2)(x+1)$ </p>	$\frac{1}{2}$ 1 1 $\frac{1}{2}$
13	i) Horizontal line- x-axis Vertical line - y-axis ii) Quadrant iii) 5 units	$\frac{1}{2} + \frac{1}{2}$ 1 1

14

$$\frac{\sqrt{5}}{2+\sqrt{5}} = a + b\sqrt{5}$$

$$\frac{\sqrt{5}}{2+\sqrt{5}} \times \frac{2-\sqrt{5}}{2-\sqrt{5}} = a + b\sqrt{5}$$

$$\frac{-5 + 2\sqrt{5}}{(2)^2 - (\sqrt{5})^2} = a + b\sqrt{5}$$

$$\frac{-5 + 2\sqrt{5}}{4 - 5} = a + b\sqrt{5}$$

$$5 - 2\sqrt{5} = a + b\sqrt{5}$$

On Comparing -

$$a = 5 \quad | \quad b = -2$$

1

1

 $\frac{1}{2} + \frac{1}{2}$

15

$$(i) (2a-3b)^3$$

$$\begin{aligned} (2a-3b)^3 &= (2a)^3 - (3b)^3 - 3(2a)^2(3b) + 3(2a)(3b)^2 \\ &= 8a^3 - 27b^3 - 36a^2b + 54ab^2 \end{aligned}$$

$$(ii) (2x-y+z)^2$$

$$\begin{aligned} (2x-y+z)^2 &= (2x)^2 + (-y)^2 + (z)^2 + 2(2x)(-y) + \\ &\quad + 2(z)(2x) \end{aligned}$$

$$= 4x^2 + y^2 + z^2 - 4xy - 2yz + 4xz$$

1

 $\frac{1}{2}$

1

 $\frac{1}{2}$