OSDAV Public School, Kaithal

Answer key (PT-1) (May,2025)
Class : xth
Subject : Maths(Set A)

Q.No.	Section-A	Marks
1	(d) more than 3	1
2	(c) Infinitely many solutions	1
3	(a) 24	1
4	(c) 20	1
5	(a) Intersects x-axis	1
	Section-B	
6	4x+y=3…………(1) 3x-2y=5…………(2) By using substitution method- From equ. (1) y=3-4x Put the value of y in equ. (2) 3x-2(3-4x) =5 x=1 Put x in equ. (1) 4(1) +y=3 Y=-1	 ½ 1 ½
7	If 15^n end with digit zero,then the number should be divisible by 2 and 5. As 2×5=10 →This means the prime factorization of 15^n should contain prime factors 2 and 5. →$15^n = (3\times5)^n$ It does not have the prime factor 2 but have 3 and 5, Since 2 is not present in the prime factorization, Also the uniqunees of fundamental theorem of arithmetic suggests that there are no other primes in the factorization of 15^n . So,15^n can not end with digit zero.	½ ½ ½ ½
8	$f(x)=kx^2+3x-2k$ Sum of zeroes=½(product of zeroes) -3/k =½(-2k/k) 3/k=1 k=3	 ½ 1 ½
9	Sum=3+(-½) =5/2=-b/a Product=-3/2=c/a On comparing a=2;b=-5;c=-3 $P(x) =2x^2-5x-3$	 ½ ½ ½ ½
10	411=3×137 321=3×107 HCF=3 Therefore 411 and 321 are not coprime	½ ½ ½ ½
	Section-C	
11	2X+Y=6 ; 2X-Y-2=0. Solutions Table-1 Solutions Table-2	 ½

	Plotting **Unique solution=(2, 2)**	½ 1½ ½
12	**Assuming 5√2 as a rational number.** **Let 5√2=r** **√2=r/5** **Therefore √2 as a rational number, i.e., can be written in the form a/b where a and b are integers with no common factors other than 1 and b is not equal to zero.** **√2/1 = a/b** **√2b = a** **By squaring on both sides** **$2b^2 = a^2$** **$b^2 = a^2/2$ .... (1)** **It means that 2 divides a^2.** **It means that it also divides a** **a = 2c** **By squaring on both sides** **$a^2 = 4c^2$** **Substituting the value of a in equation (1)** **$b^2 = 2c^2$** **$b^2/2 = c^2$** **As a is divisible by 2, b is also divisible by 2** **a and b have a common factor as 2** **It contradicts the fact that a and b are coprime** **This has arisen due to the incorrect assumption as √2 is a rational number.** **Therefore, √2 is irrational.** **So 5√2 is also irrational.**	 ½ 1 1 ½
13	**$p(x) = 2x^2 - x + 3$** **i) 1/a + 1/b= (a+b) /ab** **=(½) / (3/2) =⅓** **ii) $a^2+b^2=(a+b)^2-2ab$** **=-11/4**	 (1½) (1½)

14	Find the zeros of the polynomial Set $p(x) = 0$: ▪ $3x^2 - x - 2 = 0$ Factor the quadratic equation: ▪ $(3x + 2)(x - 1) = 0$ Solve for x: ▪ $3x + 2 = 0$ or $x - 1 = 0$ ▪ $x = -\frac{2}{3}$ or $x = 1$ The zeros of the polynomial are $-\frac{2}{3}$ and 1. **Step 2** Verify the relationship between the zeros and the coefficients Identify the coefficients: ▪ $a = 3,\ b = -1,\ c = -2$ Calculate the sum of the zeros: ▪ $-\frac{2}{3} + 1 = \frac{1}{3}$ Calculate $-\frac{b}{a}$: ▪ $-\frac{-1}{3} = \frac{1}{3}$ The sum of the zeros equals $-\frac{b}{a}$. Calculate the product of the zeros: ▪ $-\frac{2}{3} \cdot 1 = -\frac{2}{3}$ Calculate $\frac{c}{a}$: ▪ $\frac{-2}{3} = -\frac{2}{3}$ The product of the zeros equals $\frac{c}{a}$.	1 1 1
15	Let the fixed charge be Rs x and The charges for per km be Rs y Therefore x + 12 y = 89 ……… eqn 1 And x + 20 y = 145 ……..eqn 2 1 - 2 x + 12 y - x - 20 y = 89 - 145 8 y = 56 y = 7 Therefore x + 20 (7) = 145 x + 140 = 145 x = 5 Now , for 30 km x + 30 y = 5 + 30 * 7 = 5 + 210 = 215	½ ½ ½ ½ ½ ½

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Answer key (PT-1) (May,2026)
Class : xth
Subject : Maths(Set B)

Q.No.	Section-A	Marks
1	(a) Unique solution	1
2	(d) At most n zeroes	1
3	C) Irrational number	1
4	(b) -6	1
5	C) 2×7^2	1
	Section-B	
6	3x-2y=3……………(1) 2x+y=5……………(2) By using substitution method- From equ. (2) y=5-2x Put the value of y in equ. (1) 3x-2(5-2x) =3 x=13/7 Put x in equ. (2) 2(13/7) +y=5 Y=9/7	½ 1 ½
7	If 12^n end with digit zero,then the number should be divisible by 2 and 5. As 2×5=10 →This means the prime factorization of 15^n should contain prime factors 2 and 5. →$12^n = (2^2x3)^n$ It does not have the prime factor 5 but have 3 and 2, Since 5 is not present in the prime factorization, Also the uniqunees of fundamental theorem of arithmetic suggests that there are no other primes in the factorization of 12^n . So,12^n can not end with digit zero.	½ ½ ½ ½
8	$f(x)=2x^2- x+3k$ a+b=ab 1/2=3k/2 k=1/3	½ 1 ½
9	$48 =2^4x3$ $72=2^3x3^2$ LCM=144	½ ½ 1
10	Sum=3 - ¼=11/4=-b/a Product=3(-¼) =-³/4 =c/a a=4, b=-11, c=-3 $4x^2-11x-3$	½ ½ ½ ½
	Section-C	
11		½ ½

	Let x be the numerator and y be the denominator. Then, it is given that $\frac{(x+1)}{(y+1)} = \frac{4}{5}, \frac{(x-5)}{(y-5)} = \frac{1}{2}$ $\frac{(x+1)}{(y+1)} = \frac{4}{5}$ $\Rightarrow 5x + 5 = 4y + 4$ $\Rightarrow 5x - 4y + 1 = 0 \dots (1)$ $\frac{(x-5)}{(y-5)} = \frac{1}{2}$ $\Rightarrow 2x - 10 = y - 5$ $\Rightarrow 2x - y - 5 = 0 \dots (2)$ Multiplying (2) by 4, we get $8x - 4y - 20 = 0 \dots (3)$ Subtracting (3) from (1), we get $-3x + 21 = 0$ $\Rightarrow x = 7$ Putting x = 7 in (2), we get $2 \times 7 - y - 5 = 0$ $\Rightarrow y = 9.$ Therefore, the fraction is 7	½ ½ ½ ½
12	**p(x) =4x²-x-3** Rewrite the middle term using these numbers: $4x^2 - 4x + 3x - 3$. Factor by grouping: $4x(x-1) + 3(x-1)$. Factor out the common term: $(4x+3)(x-1)$. **Step 2** Find the zeros Set each factor equal to zero and solve for x. ▪ $4x + 3 = 0 \Longrightarrow x = -\frac{3}{4}$. ▪ $x - 1 = 0 \Longrightarrow x = 1$. The zeros are $-\frac{3}{4}$ and 1. **Step 3** Verify the relationship between zeros and coefficients Sum of zeros: $-\frac{3}{4} + 1 = \frac{1}{4}$. Product of zeros: $-\frac{3}{4} \times 1 = -\frac{3}{4}$. For the polynomial $4x^2 - x - 3$, $a = 4$, $b = -1$, and $c = -3$. Sum of zeros should be $-\frac{b}{a} = -\frac{-1}{4} = \frac{1}{4}$. Product of zeros should be $\frac{c}{a} = \frac{-3}{4} = -\frac{3}{4}$. The relationships are verified.	1 1 1
13	**P(x)=3x²-4x+3.** **a+b=4/3** **ab=3/4** **i) a²b+b²a=ab(a+b)** **=(3/3) (4/3) =4/3** **ii) a²+b² = (a+b)²-2ab** **=-2/9**	½ ½ 1 1
14	**Assuming 5√3 as a rational number.**	

	Let $5\sqrt{3}=r$ **$\sqrt{3}=r/5$** **Therefore $\sqrt{3}$ is a rational number, i.e., can be written in the form a/b where a and b are integers with no common factors other than 1 and b is not equal to zero.** **$\sqrt{3}/1 = a/b$** **$\sqrt{3}b = a$** **By squaring on both sides** **$3b^2 = a^2$** **$b^2= a^2/3$ .... (1)** **It means that 3 divides a2.** **It means that it also divides a** **Let a =3 c** **By squaring on both sides** **$a^2= 9c^2$** **Substituting the value of a2 in equation (1)** **$3b^2 = 9c^2$** **$b^2= 3c^2$** **As b^2 is divisible by 3, b is also divisible by 3** **a and b have a common factor as 3** **It contradicts the fact that a and b are coprime** **This has arisen due to the incorrect assumption as $\sqrt{5}$ is a rational number.** **Therefore, $\sqrt{5}$ is irrational.** **So $5\sqrt{3}$ is also irrational**	½ 1 1 ½
15	**2X+Y=6 ; 2X-Y+2=0.** **Solutions Table-1** **Solutions Table-2** **Plotting** **Unique solution=(1, 4)**	 ½ ½ 1½ ½