SHRI VIDHYABHARATHI
MATRIC. HR. SEC. SCHOOL
SAKKARAMPALAYAM, AGARAM POST, ELACHIPALAYAM, THIRUCHENGODE TK, NAMAKKAL DT - 637 202.
Cell : 99655-31727, 94432 31727

S.S.L.C PUBLIC EXAM - APRIL 2025

SSLC - MATHEMATICS - ANSWER KEY MARKS: 100

PART – I (Marks 14)

Choose the correct answers:		14 x 1 =14
Q. No.	Option	Answer
1	c	{ 4 , 9, 25, 49, 121 }
2	a	m^n (Creative)
3	c	$0 \leq r < b$
4	a	0
5	b	5
6	d	row matrix
7	b	point of contact
8	d	$7x - 3y = 0$ (Creative)
9	b	1
10	d	$60°$
11	d	$136\ \pi\ cm^2$
12	a	$\frac{4}{3}\pi$
13	a	P(A) > 1
14	d	$\frac{4}{5}$

PART – II [MARKS : 20]

Answer any TEN Questions [Question No. 28 is compulsory]. **Each questions carries 2 marks.**		**10x2=20**
15	$B = \{2, 3, 5, 7\}$ $A \times B = \{(1,2),(1,3),(1,5),(1,7),(2,2),(2,3),(2,5),(2,7),(3,2),(3,3),(3,5),(3,7)\}$	1 1
16	$f \circ g = f[g(x)] = f(x^2 - 2) = 2(x^2 - 2) + 1 = 2x^2 - 4 + 1 = 2x^2 - 3$ $g \circ f = g[f(x)] = g(2x + 1) = (2x + 1)^2 - 2 = 4x^2 + 4x - 1$	1 1
17	$\therefore 532 = 21q + r \Rightarrow 532 = 21 \times 25 + 7$ $\therefore$ Number of completed rows = 25 Number of flower pots left out = 7	1 1
18	$\frac{x^3}{x-y} + \frac{y^3}{y-x} = \frac{x^3}{x-y} - \frac{y^3}{x-y} = \frac{x^3 - y^3}{x-y}$ $= \frac{(x-y)(x^2 + xy + y^2)}{x-y}$ $\therefore \frac{x^3}{x-y} + \frac{y^3}{y-x} = x^2 + xy + y^2$	1 1
19	$AB = \begin{pmatrix} 5 & 3 \\ 5 & 9 \end{pmatrix}$ $BA = \begin{pmatrix} 4 & 2 \\ 5 & 10 \end{pmatrix}$ $\therefore AB \neq BA$	1 1
20	**By ABT,** $\frac{BD}{DC} = \frac{AB}{AC}$ **(or)** $\frac{4}{3} = \frac{6}{AC}$ $AC = \frac{9}{2} = 4.5$ cm	1 1

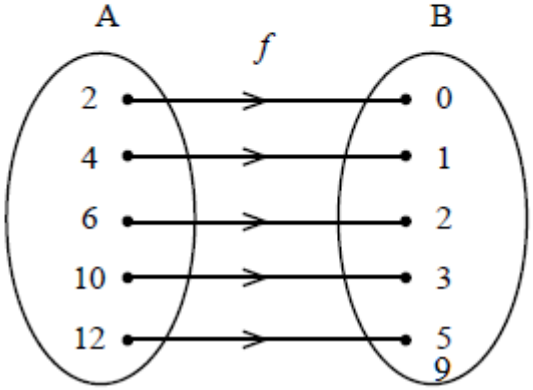
21	$\therefore \frac{y_2-y_1}{x_2-x_1}=-\frac{1}{2}$ (or) $\frac{3-a}{9+2}=\frac{-1}{2}$ $6-2a=-11 \Rightarrow \boxed{\therefore a=\frac{17}{2}}$	1 1
22	$m_1=\frac{-1}{-2}=\frac{1}{2}$, $m_2=\frac{-6}{3}=-2$ $m_1 \times m_2=\frac{1}{2}\times(-2)=-1$ The lines are perpendicular. (or) $a_1=1, b_1=-2;\ a_2=6, b_2=3$ $a_1a_2+b_1b_2=6-6=0$ The lines are perpendicular.	1 1
23	$\tan 30^\circ=\frac{AB}{BC} \Rightarrow \frac{1}{\sqrt{3}}=\frac{50\sqrt{3}}{d}$ $d = 50\sqrt{3}\times\sqrt{3} = 50\times 3 = 150$ m.	1 1
24	$\frac{V_1}{V_2}=\frac{\frac{4}{3}\pi r_1^3}{\frac{4}{3}\pi r_2^3}=\left(\frac{r_1}{r_2}\right)^3=\left(\frac{4}{7}\right)^3=\frac{64}{343}$ $\therefore$ Ratio of the volumes = 64 : 343	1 1
25	C.S.A. of the frustum $=\pi(R+r)l$ sq. units $=\frac{22}{7}\times(4+1)\times 5=\frac{550}{7}=78.5714....=78.57$ cm^2	1 1
26	Largest value L = 28; Smallest value S = 18 Range R = L − S R = 28 − 18 = 10Years. Range = 10 Years	1 1
27	Total number of flowers = 80+70+50=200 $n(S)=200$ $n(Y)=80 \Rightarrow \therefore P(Y)=\frac{80}{200}=\frac{2}{5}$	1 1

28	$\sqrt{2}, 2\sqrt{2}, 3\sqrt{2}, 4\sqrt{2}, 5\sqrt{2}, \ldots\ldots\ldots\ldots$ $t_2 - t_1 = 2\sqrt{2} - \sqrt{2} = \sqrt{2}, \quad t_3 - t_2 = 3\sqrt{2} - 2\sqrt{2} = \sqrt{2}$ $t_4 - t_3 = 4\sqrt{2} - 3\sqrt{2} = \sqrt{2}, \quad t_5 - t_4 = 5\sqrt{2} - 4\sqrt{2} = \sqrt{2}$ $\therefore t_2 - t_1 = t_3 - t_2 = t_4 - t_3 = t_5 - t_4$ *The given sequence is an A.P.* $\therefore$ *Common difference* $= \sqrt{2}$ **(Creative)**	1 1

PART – III [MARKS : 50]

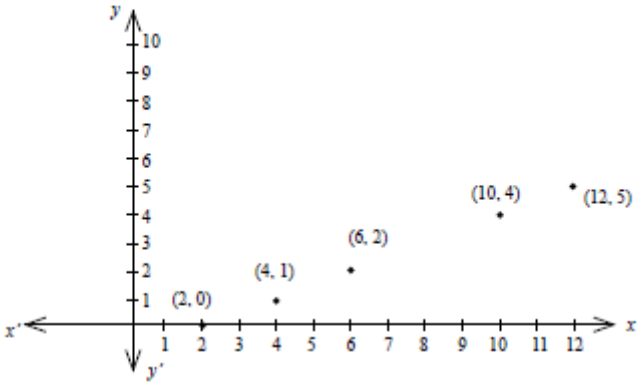
Answer any TEN Questions [Question No. 42 is compulsory].

Each questions carries 5 marks.

29	$A = \{1,2,3,4,5,6,7\}, \quad B = \{2,3,5,7\}, \quad C = \{2\}$ $LHS : (A \cap B) = \{2,3,5,7\}$ $(A \cap B) \times C = \{(2,2),(3,2),(5,2),(7,2)\} \ldots\ldots\ldots\ldots\ldots (1)$ $RHS : (A \times C) = \{(1,2),(2,2),(3,2),(4,2),(5,2),(6,2),(7,2)\}$ $(B \times C) = \{(2,2),(3,2),(5,2),(7,2)\}$ $(A \times C) \cap (B \times C) = \{(2,2),(3,2),(5,2),(7,2)\} \ldots\ldots\ldots\ldots\ldots (2)$ $(1) = (2)$. *Hence proved.*	1 1 1 1 1
30	$f(2) = 0, f(4) = 1, f(6) = 2, f(10) = 4, f(12) = 5$ **(i) Set of order pairs :** $f = \{(2, 0), (4, 1), (6, 2), (10, 4), (12, 5)\}$ **(ii) Table :** **(iii) Arrow diagram :**  	1 1 1 1

x	2	4	6	10	12
f(x)	0	1	2	4	5

(iv) Graph



1

31

$113400 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 5 \times 5 \times 7$

1

$\therefore\ 113400 = 2^3 \times 3^4 \times 5^2 \times 7^1$

$\therefore\ p_1 = 2, p_2 = 3, p_3 = 5, p_4 = 7$ and

$x_1 = 3, x_2 = 4, x_3 = 2, x_4 = 1$

2

2

32

$\because\ \Sigma n^2 = \dfrac{n(n+1)(2n+1)}{6}$

1

$6^2 + 7^2 + 8^2 + \ldots\ldots + 21^2 = (1^2 + 2^2 + 3^2 + \ldots\ldots + 21^2) - (1^2 + 2^2 + \ldots\ldots + 5^2)$

1

$= \dfrac{21 \times 22 \times 43}{6} - \dfrac{5 \times 6 \times 11}{6}$

1

$= 3311 - 55$

1

$\therefore\ 6^2 + 7^2 + 8^2 + \ldots\ldots + 21^2 = 3256$

1

33

$AB = \begin{pmatrix} 2-2+0 & -1+8+2 \\ 4+1+0 & -2-4+2 \end{pmatrix} = \begin{pmatrix} 0 & 9 \\ 5 & -4 \end{pmatrix}$

1

$(AB)^T = \begin{pmatrix} 0 & 5 \\ 9 & -4 \end{pmatrix}$ ------- (1)

1

$B^T = \begin{pmatrix} 2 & -1 & 0 \\ -1 & 4 & 2 \end{pmatrix}; A^T = \begin{pmatrix} 1 & 2 \\ 2 & -1 \\ 1 & 1 \end{pmatrix}$

2

$B^T A^T = \begin{pmatrix} 2-2+0 & 4+1+0 \\ -1+8+2 & -2-4+2 \end{pmatrix} = \begin{pmatrix} 0 & 5 \\ 9 & -4 \end{pmatrix}$ ------- (2)

1

From (1) and (2), $(AB)^T = B^T A^T$

34	Statement Figure Given , To prove , Construction Proof **Note :- If No figure then only marks allotted for statement**	1 1 1 2
35	$\frac{1}{2}\begin{bmatrix}-4 & -3 & 3 & 2 & -4\\ -2 & k & -2 & 3 & -2\end{bmatrix} = 28$ sq. units $\frac{1}{2}[(-4k+6+9-4)-(6+3k-4-12)] = 28$ $(-4k+6+9-4)-(6+3k-4-12) = 56$ $(11-4k)-(3k-10) = 56$ $21-7k = 56$ $\therefore 7k = -35$ $\therefore k = -5$	1 1 1 1 1 1
36	$a+b=7 \Rightarrow b=7-a$ $\frac{x}{a}+\frac{y}{b}=1 \Rightarrow \frac{x}{a}+\frac{y}{7-a}=1$ --------> (1) line pass through the point $(-3,8)$, $\frac{-3}{a}+\frac{8}{7-a}=1 \Rightarrow -3(7-a)+8a = a(7-a)$ $a^2+4a-21=0$ $(a-3)(a+7)=0 \Rightarrow a=3$ or $a=-7$ Since a is positive, we have $a=3$ and $b=7-a=7-3=4$. $\frac{x}{3}+\frac{y}{4}=1$ (From (1)) $4x+3y-12=0$ is the required equation.	1 1 1 1 1 1

37	$\frac{\sin^3 A+\cos^3 A}{\sin A+\cos A}+\frac{\sin^3 A-\cos^3 A}{\sin A-\cos A}$:	
	$=\frac{(\sin A+\cos A).(\sin^2 A-\sin A\cos A+\cos^2 A)}{\sin A+\cos A}+$	2
	$\frac{(\sin A-\cos A).(\sin^2 A+\sin A\cos A+\cos^2 A)}{\sin A-\cos A}$	
	$=(1-\sin A\cos A)+(1+\sin A\cos A)$	2
	$=2$	1
38	For Cylinder,	
	Diameter = 3 cm , Radius = $\frac{3}{2}$ cm = 1.5 cm	
	Height of the Cylinder h_1 = 12 - 4 = 8 cm	
	For 2 Cones, Radius = $\frac{3}{2}$ cm = 1.5 cm	
	Height h_2 = 2 cm	1
	$\therefore$ Volume of the model = Vol. of Cylinder + 2 (Vol. of Cone)	
	$=\pi r^2 h_1+2\left(\frac{1}{3}\pi r^2 h_2\right)=\pi r^2\left(h_1+\frac{2}{3}h_2\right)=\frac{22}{7}\times\frac{3}{2}\times\frac{3}{2}\times\left[8+\frac{2}{3}(2)\right]$	2
	$\therefore$ Volume of the model $=\frac{99}{14}\times\left[\frac{28}{3}\right]=33\times 2=66\ cm^3$	2
39	R = 16 cm ; r = 2 cm	
	$n=\frac{\text{Volume of metallic Sphere}}{\text{Volume of Small Sphere}}$	1
	$n=\frac{\frac{4}{3}\pi R^3}{\frac{4}{3}\pi r^3}=\frac{R^3}{r^3}=\frac{16\times16\times16}{2\times2\times2}=8\times8\times8$	3
	$\therefore$ Number of Small Spheres = 512	1

40

Sathya

$\therefore \bar{x}_1 = \frac{460}{5}$

$\therefore \bar{x}_1 = 92$

Vidhya

$\therefore \bar{x}_2 = \frac{480}{5}$

$\therefore \bar{x}_2 = 96$ — 2

$\therefore C.V_1 = \frac{\sigma_1}{\bar{x}_1} \times 100 = \frac{4.6}{92} \times 100$ $\therefore C.V_1 = 5$ — 1

$\therefore C.V_2 = \frac{\sigma_2}{\bar{x}_2} \times 100 = \frac{2.4}{96} \times 100$ $\therefore C.V_2 = 2.5$ — 1

$\therefore \quad C.V_2 < C.V_1$

$\therefore$ Vidhya is more consistent than Sathya. — 1

41

Total number of balls = 5+6+7+8 = 26, n(S) = 26 — 1

(i) white : Number of white balls = 6, n(A) = 6

$$P(A) = \frac{n(A)}{n(S)} = \frac{6}{26} = \frac{3}{13} \quad \boxed{P(A) = \frac{3}{13}}$$ — 1

(ii) black or red : Number of black and red balls = 8 + 5 = 13 , n(B) = 13

$$P(B) = \frac{n(B)}{n(S)} = \frac{13}{26} = \frac{1}{2} \quad \boxed{P(B) = \frac{1}{2}}$$ — 1

(iii) not white

$$P(\bar{A}) = 1 - P(A) = 1 - \frac{3}{13} = \frac{13-3}{13} = \frac{10}{13} \quad \boxed{P(\bar{A}) = \frac{10}{13}}$$ — 1

(iv) neither white nor black

Number of balls which is neither white nor black balls = 7+5 = 12

n(C) = 12

$$P(C) = \frac{n(C)}{n(S)} = \frac{12}{26} = \frac{6}{13} \quad \boxed{P(C) = \frac{6}{13}}$$ — 1

42

$(x-1)^2 + (x-2)^2 + (x-3)^2 = 0$

$x^2 - 2x + 1 + x^2 - 4x + 4 + x^2 - 6x + 9 = 0$ — 1

$3x^2 - 12x + 14 = 0$ — 1

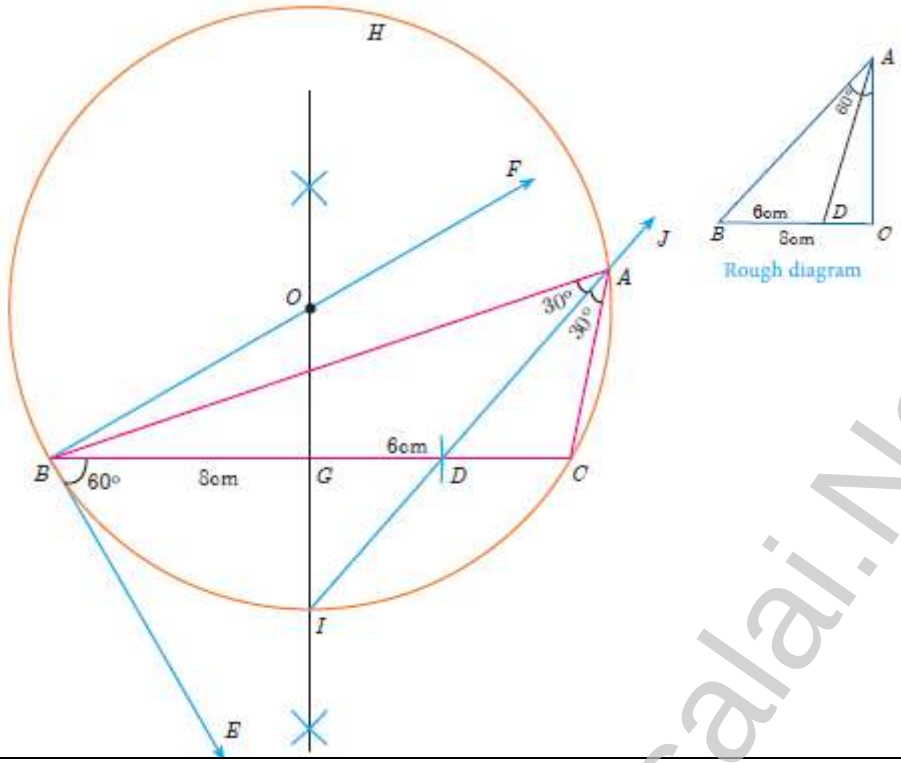
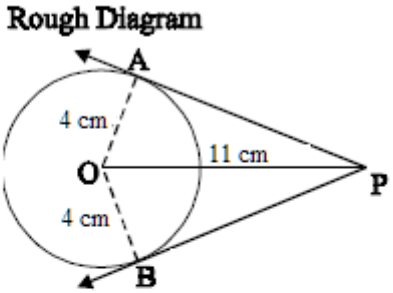
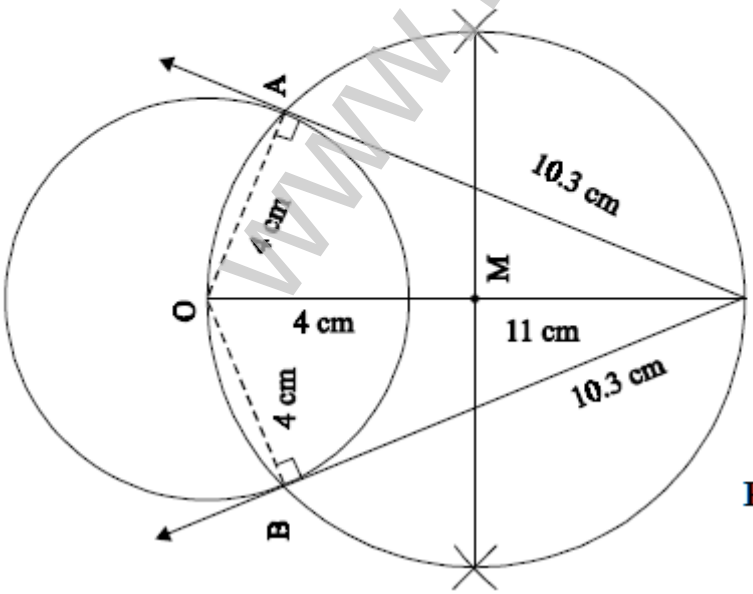
$a = 3, b = -12, c = 14$ — 1

$\Delta = b^2 - 4ac = 144 - 168 = -24$ — 1

$\Delta < 0 \therefore$ *Equation has no real roots.* — 1

(Creative)

PART – IV [MARKS : 16]

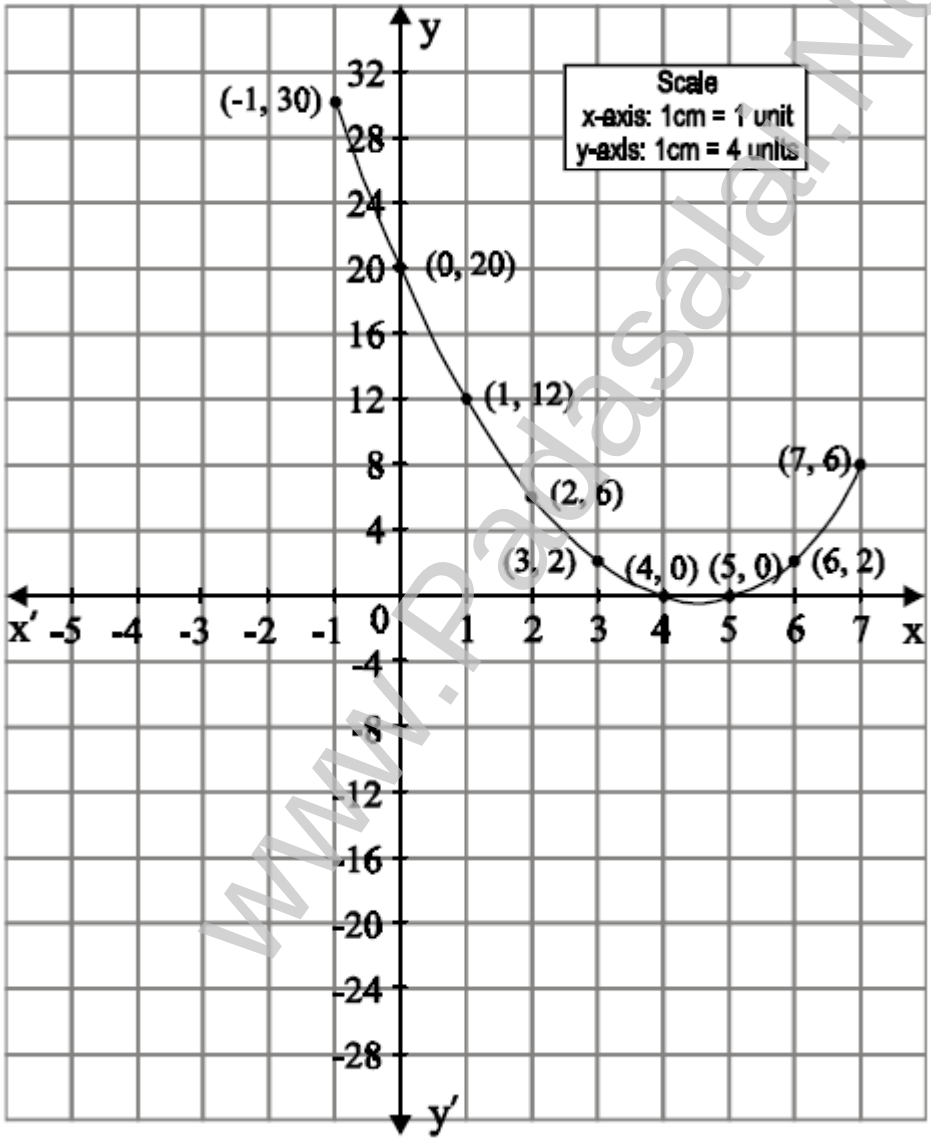
Answer All the questions. Each questions carries 8 marks		2x8=16
43(a)	 Rough diagram	1 7
	(OR)	
43(b)	  PA = PB = 10.2 cm (or) 10.3 cm	1 7

44(a)

Let $y = x^2 - 9x + 20$

X :	-2	-1	0	1	2	3	4	5	6	7
x^2 :	4	1	0	1	4	9	16	25	36	49
$-9x$:	18	9	0	-9	-18	-27	-36	-45	-54	-63
20 :	20	20	20	20	20	20	20	20	20	20
$y = x^2 - 9x + 20$:	42	30	20	12	6	2	0	0	2	6

2



4+1

The curve cut the x-axis at the points (4,0) and (5,0)

Solution : { 4 , 5 }

1

The equation has Real and unequal Roots.

44(b)

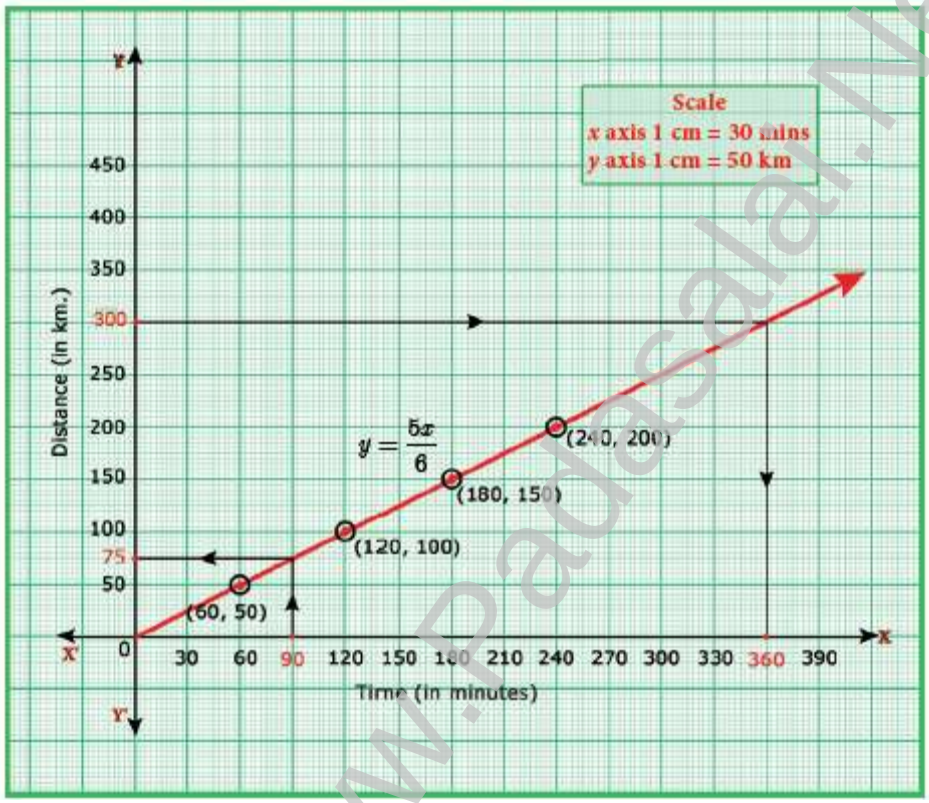
Let x be the time taken in minutes and y be the distance travelled in km. — 2

Time taken x (in minutes)	60	120	180	240
Distance y (in km)	50	100	150	200

(i) Observe that as time increases, the distance also increases. The variation is a direct variation. It is of the form $y = kx$.

Constant of variation $k = \frac{y}{x} = \frac{50}{60} = \frac{5}{6}$

$y = kx \Rightarrow y = \frac{5}{6}x$



2+1

(i) Constant of variation $k = \frac{5}{6}$ — 1

(ii) From the graph, $x = 90$, then $y = 75$ km — 1

(iii) From the graph, $y = 300$ then $x = 360$ minutes (or) 6 hours. — 1

MARK ANALYSIS

(WITHOUT CHOICE)

PART	Questions	Total Questions	Book Back Questions	Interior Questions	Total Marks
I	1 Mark	14	12	2	14
II	2 Marks	14	13	1	28
III	5 Marks	14	13	1	70
IV	8 Marks	4	4	-	32
Total Marks			135	9	144
Percentage			93.7%	6.3%	100%

Department of MATHEMATICS

SHRI VIDHYABHARATHI MATRIC HR. SEC. SCHOOL
SAKKARAMPALAYAM , AGARAM (PO) ELACHIPALAYAM
TIRUCHENGODE(TK), NAMAKKAL (DT) PIN-637202.

Cell: 99655 31727