Padasalai's
Telegram Groups!

(தலைப்பிற்கு கீழே உள்ள லிங்கை கிளிக் செய்து குழுவில் இணையவும்!)

- Padasalai's NEWS - Group

https://t.me/joinchat/NIfCqVRBNj9hhV4wu6_NqA

- Padasalai's Channel - Group

https://t.me/padasalaichannel

- Lesson Plan - Group

https://t.me/joinchat/NIfCqVWwo5iL-21gpzrXLw

- 12th Standard - Group

https://t.me/Padasalai_12th

- 11th Standard - Group

https://t.me/Padasalai_11th

- 10th Standard - Group

https://t.me/Padasalai_10th

- 9th Standard - Group

https://t.me/Padasalai_9th

- 6th to 8th Standard - Group

https://t.me/Padasalai_6to8

- 1st to 5th Standard - Group

https://t.me/Padasalai_1to5

- TET - Group

https://t.me/Padasalai_TET

- PGTRB - Group

https://t.me/Padasalai_PGTRB

- TNPSC - Group

https://t.me/Padasalai_TNPSC

10 கணிதம். வரைபடம் - இருபடி சமன்பாடுகள்.

மெல்லக் கற்போருக்கான குறிப்புகள்

TIPS TO SLOW LEARNERS.

மெல்லக் கற்கும் மற்றும் கிராமப்புற மாணவர்களுக்கு, மிகக் கடினமாகத் தோன்றும் வரைபடம் பகுதியை ஓரளவு எளிமையாகக் கற்க/ கற்பிக்க, 10ம் வகுப்பு புதிய புத்தக பயிற்சியின்போது, அனைத்து ஆசிரியர்களாலும் வழங்கப்பட்ட குறிப்புகளின் தொகுப்பு இது.

By: M.PALANIYAPPAN,
NERKUPPAI.

I. புள்ளிகள்: (POINTS).

→ தீர்வு காண வேண்டிய சமன்பாட்டை ($ax^2+bx+c=0$ வடிவில் உள்ளது) காரணிப்படுத்தி, கிடைக்கும் x ன் மதிப்பைப் பொறுத்து, x அச்சில் புள்ளிகளைத் தேர்ந்தெடுக்கலாம். குறைந்தபட்சம் 7 புள்ளிகள். For example, $x^2+3x-4=0$ ஐத் தீர்க்க, $x=-4, 1$ கிடைக்கும். x அச்சில், -5 to 2 வரை 8 புள்ளிகள்.

→ காரணிப்படுத்துவதில், மிகவும் பலவீனமான மாணவர்களுக்கு, பின்வரும் உத்தி பயன்படலாம்:

இந்த TIPS புத்தகத்தில் உள்ள கணக்குகளுக்கு மட்டுமே பொருந்தும்.

1. தீர்வு காண வேண்டிய சமன்பாட்டின் x ன் கெழுவின் குறி '+' எனில், x அச்சில் தேவைப்படும் புள்ளிகள் **-3 to 3 (7 புள்ளிகள்).**

   x ன் கெழு '0' எனும் போதும் (i.e $x^2+1=0$). -3 to 3 போதுமானது.

   '+','0' வகையில் புத்தகத்தில் 10 கணக்குகள் உள்ளது. (எகா 3.48(i), பயி 3.15 – 5) தவிர்த்து, மற்ற 8 கணக்குகளுக்கும் இந்த உத்தி பயனளிக்கிறது.

2. 'x'ன் கெழுவின் குறி '−' மைனஸ் எனில், x அச்சில் தேவைப்படும் புள்ளிகள் **0→6** (7 புள்ளிகள்). இந்த வகையில் 10 கணக்குகள் உள்ளது. பயி 3.15 – 7,8 தவிர மற்ற 8 கணக்குகளுக்கு இவ்வுத்தி பொருந்துகிறது.

→ நேர்கோடு வரைய, x அச்சில் $-1, 0, 1$ ஆகிய மூன்று புள்ளிகள் போதுமானது. இரு புள்ளிகளே போதும். எனினும், ஏதேனும் ஒரு புள்ளி தவறானால், கோடு தவறாகிவிடும். 3 புள்ளியில், தவறு நேர்ந்தால், கோடு வரைய இயலாது. ∴ மூன்று அவசியம்.

II. அட்டவணை: (Table)

→ 20ல் 17 கணக்குகளுக்கு, x^2ன் கெழு 1 ஆக உள்ளது. ஆகவே, வர்க்க வாய்ப்பாட்டை மனனம் செய்தல் வேண்டும். ஆரம்பத்தில் தொடங்கி, 1, 4, 9, 16, 25, 36... என x^2 வரிசையை நிரப்பலாம். 0க்கு இடப்புறம் அதனை இடவலமாக (Reverse order). நிரப்பலாம்.

→ x ன் எண் கெழுவைக் குறித்து, அதன் வாய்ப்பாட்டை நினைவுகூற வேண்டும். உதாரணமாக, $5x$ எனில், 5ம் வாய்ப்பாட்டை, 0-ல் துவங்கி, 5, 10, 15 என அந்த வரிசையில் எழுதவும். 0க்கு இடப்புறம் reverse order ல் எழுதி, குறைக்குறி (−) இடவேண்டும்.

→ x ன் குறி '−' எனில், மேற்கூறிய வகையில் வரிசையை நிரப்பிய பிறகு, அனைத்து எண்களுக்கும் குறியை மாற்றிவிட வேண்டும்.

→ அட்டவணையில், 'y' வரிசைக்கும், (Last) 'மாறிலி' வரிசைக்கும் இடையே இரு வரிசைகளை உருவாக்கவேண்டும். முதல் வரிசையில், '+' குறி உள்ள எண்களை கூட்டி எழுதிடவும், 2ம் வரிசையில் '−' குறி உள்ள எண்களைக் கூட்டி, குறைக்குறியிட்டு எழுதிடவும் பயின்றால், +, − கூட்டல் கழித்தலால் தவறு நேராது.

III. மற்றவை (Others):

→ அனைத்துக் கணக்குகளுக்கும் ஒரே அளவுத்திட்டம் பொருந்துகிறது.
அதாவது, x அச்சில் → 1 செமீ = 1 அலகு
y அச்சில் → 1 செமீ = 2 அலகுகள்

→ வரைபடத்தாளில், x, y அச்சுகள் வரைய, அதன் இருசமபாகங்களை பிரிக்கும் வகையில் அமையலாம். இது அனைத்துக் கணக்குகளுக்கும் பொருந்துகிறது.

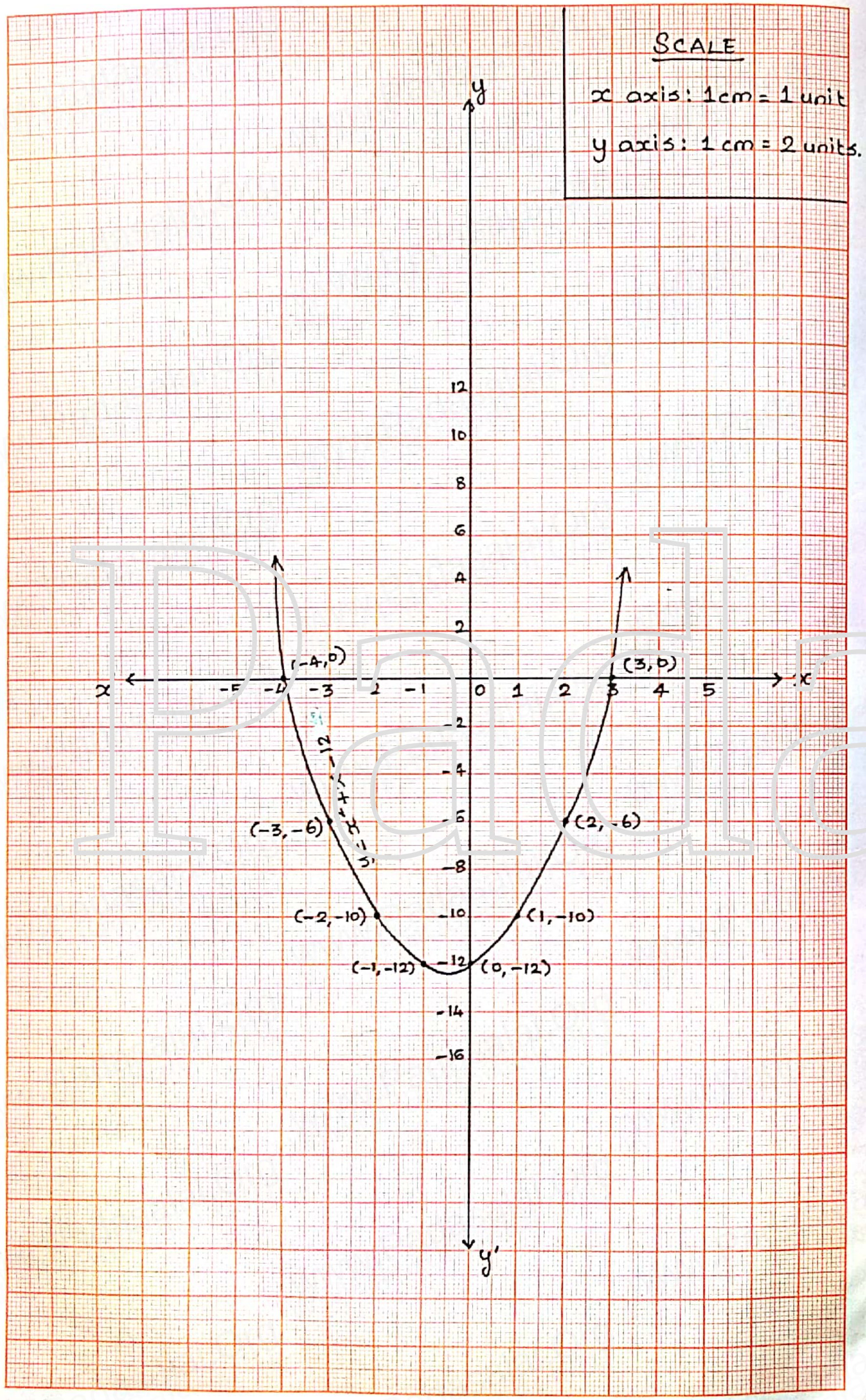
M.PALANIYAPPAN, NERKUPPAI.

Chima

INDEX

Name .... Std .... Sec .... Roll No ....

No.	Date	Title	Marks / Pages	Signature
		M.PALANIYAPPAN, MSc., BEd., MPhil,		
		SGHSS, NERKUPPAI.		
		GRAPH NOTE.		
		2019-20.		
		M. PALANIAPPAN, M.Sc., B.Ed.,		
		B.T. Assistant (Maths)		
		SGHSS., NERKUPPAI, SVG. Dist		



Example 3.48 (1) Pg.125

① Discuss the nature of solutions: $x^2+x-12=0$.

Soln: $x^2+x-12=0$

$(x-3)(x+4)=0$

$\therefore x = 3, -4.$

-12	1
1	-12 ×
2	-6 ×
3	-4 ×
-3	4 ✓

Hence, we need 8 points in x axis. (-4 to 3).

I. TABLE: Let us find the points for $y = x^2+x-12$.

x	-4	-3	-2	-1	0	1	2	3
x^2	16	9	4	1	0	1	4	9
x	-4	-3	-2	-1	0	1	2	3
-12	-12	-12	-12	-12	-12	-12	-12	-12
TOTAL +	16	9	4	1	0	2	6	12
TOTAL −	-16	-15	-14	-13	-12	-12	-12	-12.
y	0	-6	-10	-12	-12	-10	-6	0

II. POINTS:

(-4,0) (-3,-6) (-2,-10) (-1,-12) (0,-12) (1,-10) (2,-6) (3,0)

III. Points of intersection with x axis:

(-4,0) and (3,0). Hence, x-coordinates, -4 and 3.

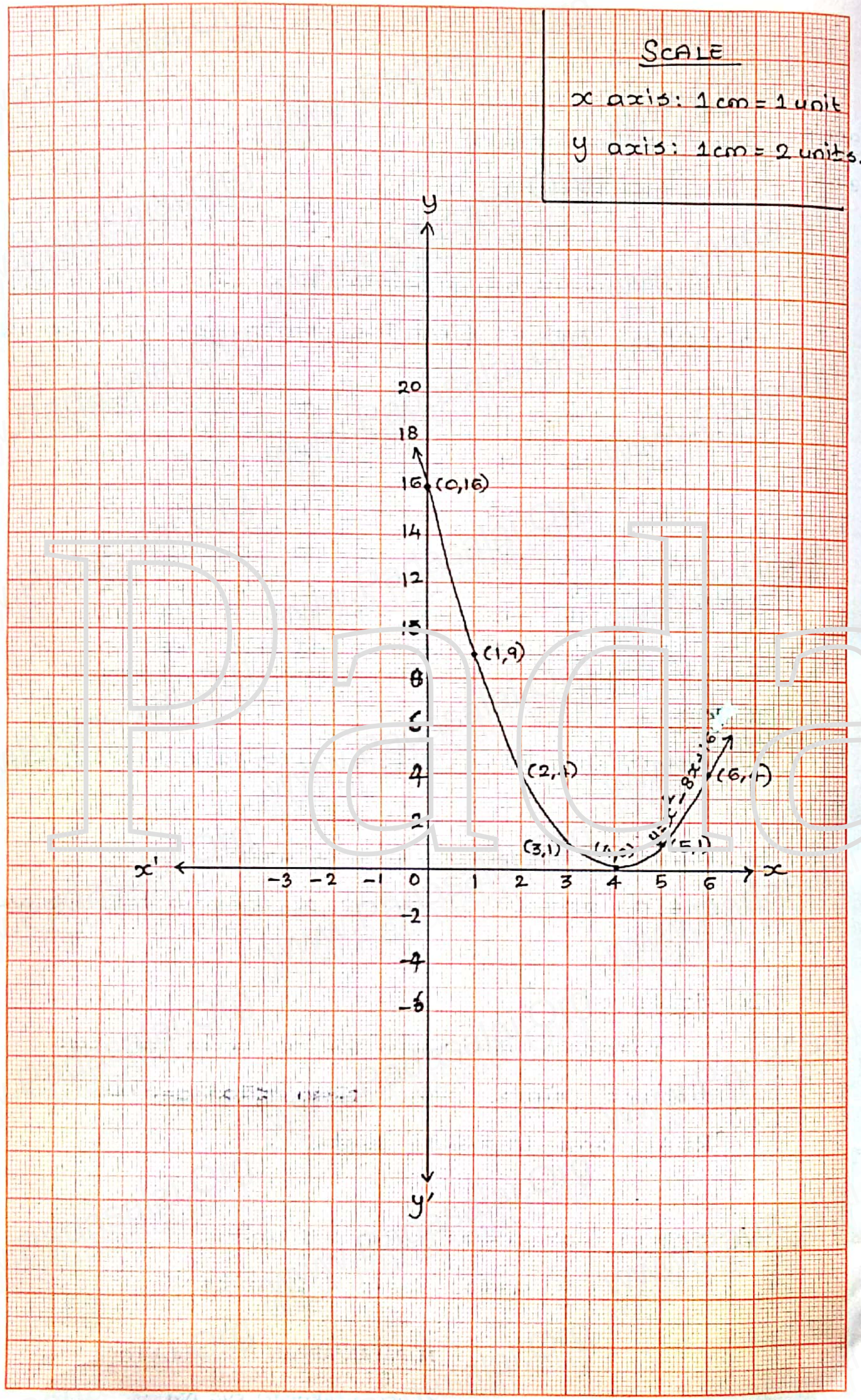
IV. SOLUTION:

Parabola intersects the x-axis at two distinct points. Hence, the eqn. $x^2+x-12=0$ has 'REAL and UNEQUAL' Roots.

V. SCALE: x axis: 1 cm = 1 unit.

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed., MPhil,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



Example 3.48 (ii) Pg: 125.

(2) Discuss the nature of solutions: $x^2 - 8x + 16 = 0$.

Soln: $x^2 - 8x + 16 = 0$

$(x-4)(x-4) = 0 \quad \therefore x = 4.$

$\begin{array}{r|l} 16 & -8 \\ -1 & -16 \times \\ -4 & -4 \checkmark \end{array}$

Thus, we need 7 points in x axis $(0 \to 6)$

I. TABLE:

Let us find the points for $y = x^2 - 8x + 16$.

x	0	1	2	3	4	5	6
x^2	0	1	4	9	16	25	36.
$-8x$	0	-8	-16	-24	-32	-40	-48
16	16	16	16	16	16	16	16
Total: + −	16 0	17 -8	20 -16	25 -24	32 -32	41 -40	52 -48
y	16	9	4	1	0	1	4

II. POINTS: (0,16) (1,9) (2,4) (3,1) (4,0) (5,1) (6,4)

III. Points of intersection with x axis:

(4,0) $\quad x$ co-ordinate is 4.

IV. SOLUTIONS:

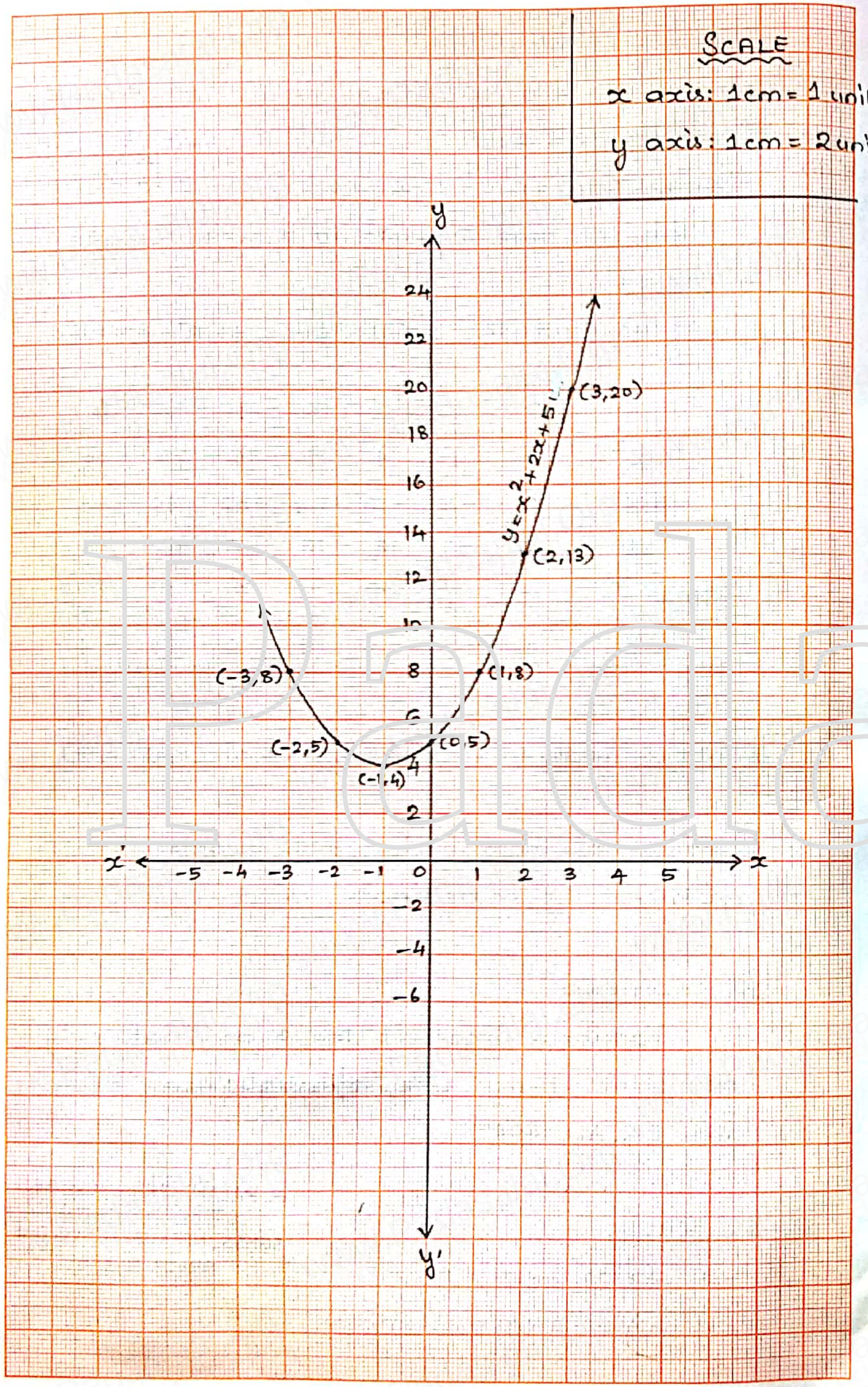
Parabola intersect the x axis at only one point. Hence, the eqn. $x^2 - 8x + 16 = 0$ has REAL and EQUAL ROOTS.

V. SCALE:

x axis: 1 cm = 1 unit

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed.,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



(3) Example 3.48 (iii) Pg. 127.

Discuss the nature of solutions: $x^2+2x+5=0$.

Soln.:

$x^2+2x+5=0$

$$\begin{array}{c|l} 5 & 2 \\ \hline 1 & 5 = 6 \times \\ 5 & 1 = 6 \times \end{array}$$

∴ No solution.

Hence, we have 7 points in x axis (-3 to 3).

I. TABLE:

Let us find the points for $y = x^2+2x+5$

x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
$2x$	-6	-4	-2	0	2	4	6
5	5	5	5	5	5	5	5
Total: + / −	14 / -6	9 / -4	6 / -2	5 / 0	8 / 0	13 / 0	20 / 0
y	8	5	4	5	8	13	20

II. POINTS: $(-3,8)$ $(-2,5)$ $(-1,4)$ $(0,5)$ $(1,8)$ $(2,13)$ $(3,20)$

III. POINT OF INTERSECTION with x axis:

Does not intersect x axis.

IV. SOLUTIONS:

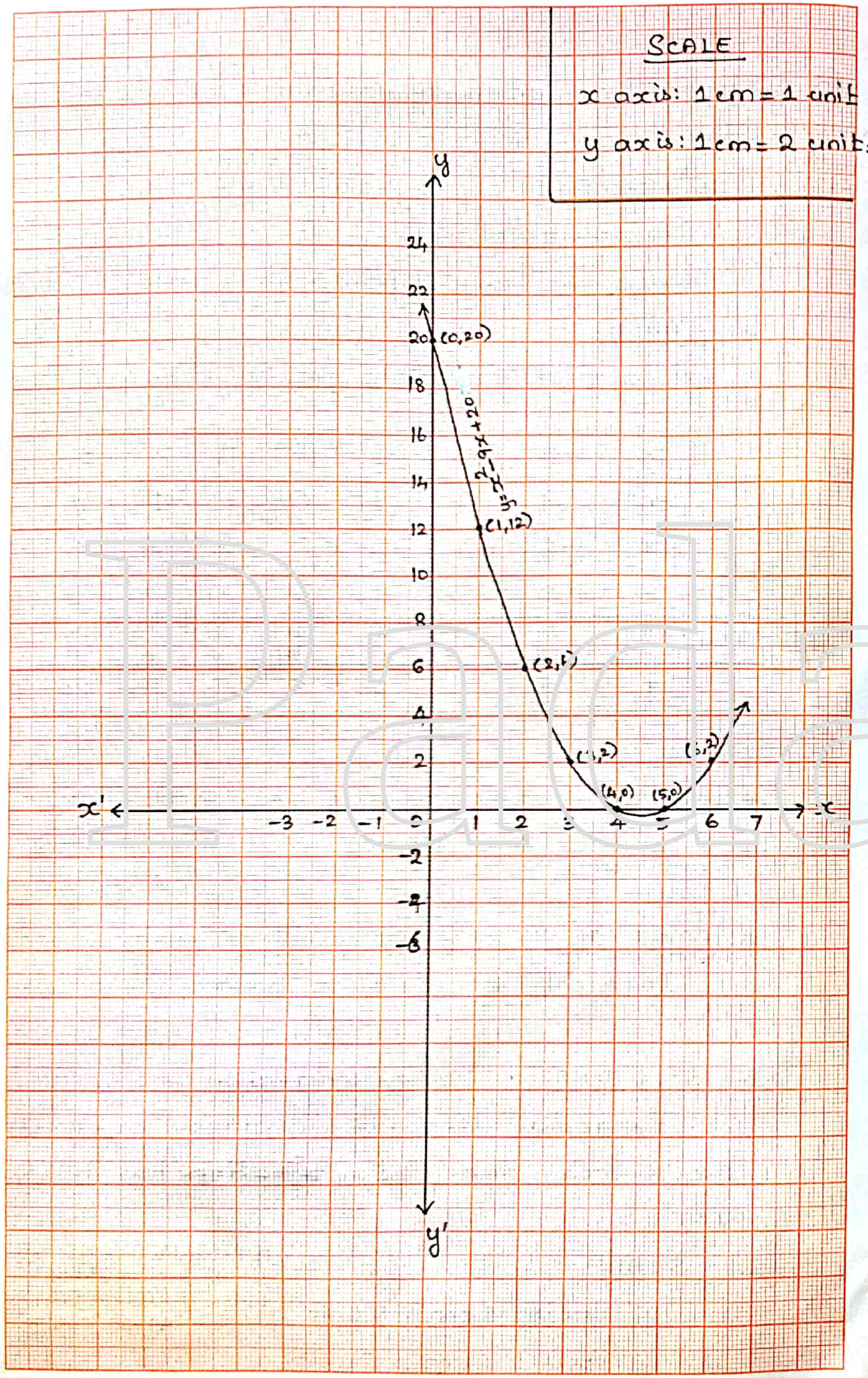
Parabola does not intersect or touch the x axis. Hence the eqn. $x^2+2x+5=0$ has NO REAL ROOT.

V. SCALE:

x axis: 1 cm = 1 unit

y axis: 1 cm = 2 unit.

M. PALANIAPPAN, M.Sc., B.Ed.,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



Ex 3.15
1 (i)
Pg. 132

④ State the nature of solutions: $x^2-9x+20=0$.

Soln: $x^2-9x+20=0$

$(x-4)(x-5)=0$

$\therefore x=4,5.$

20	−9
−1	20 = −21 ×
−2	−10 = −12 ×
−4	−5 = −9 ✓

We need 7 points in x axis (0 to 6)

I. TABLE:

Let us find the points for $y=x^2-9x+20$.

x	0	1	2	3	4	5	6
x^2	0	1	4	9	16	25	36
$-9x$	0	−9	−18	−27	−36	−45	−54
20	20	20	20	20	20	20	20
Total: + / −	20 / 0	21 / −9	24 / −18	29 / −27	36 / −36	45 / −45	56 / −54
y	20	12	6	2	0	0	2

II. POINTS: (0,20) (1,12) (2,6) (3,2) (4,0) (5,0) (6,2)

III. POINT OF INTERSECTION with x axis:

(4,0) and (5,0). x co-ordinates 4 and 5.

IV. SOLUTIONS:

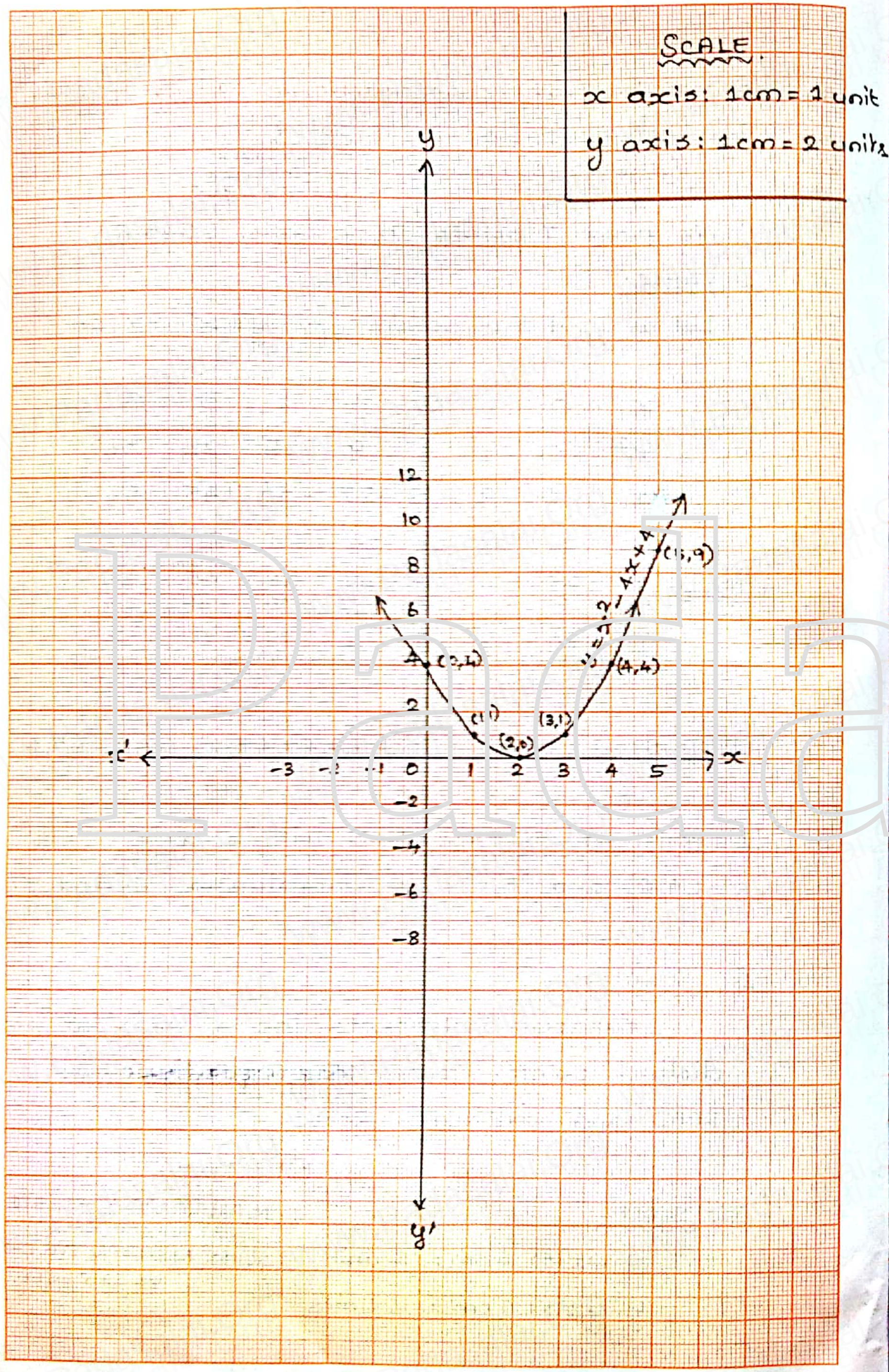
Parabola intersects the x axis at two distinct points. Hence, the eqn. $x^2-9x+20=0$ has REAL and UNEQUAL Roots.

V. SCALE:

x axis: 1 cm = 1 unit

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed.,
B.T. Assistant (Maths)
SGHSS, NERKUPPAL, SVG. Dist
99429 04874.



(5) State the nature of solutions: $x^2-4x+4=0$

Ex 3.15 1(ii) Pg.132

Soln: $(x^2-4x+4)=0$

$(x-2)(x-2)=0$ $\boxed{\therefore x=2}$

4	−4
−2	−2 = −4 ✓
−1	−4 = −5 ✗

Required points in x axis: 0 − 5 (6 points)

I. TABLE:

Let us find the points for $y = x^2-4x+4$

x	0	1	2	3	4	5
x^2	0	1	4	9	16	25
$-4x$	0	−4	−8	−12	−16	−20
4	4	4	4	4	4	4
Tot: + / −	4 / 0	5 / −4	8 / −8	13 / −12	20 / −16	29 / −20
y	4	1	0	1	4	9

II. POINTS: (0,4) (1,1) (2,0) (3,1) (4,4) (5,9)

III. POINT OF INTERSECTION with x axis:

(2,0). x co-ordinate is 2.

IV. SOLUTIONS:

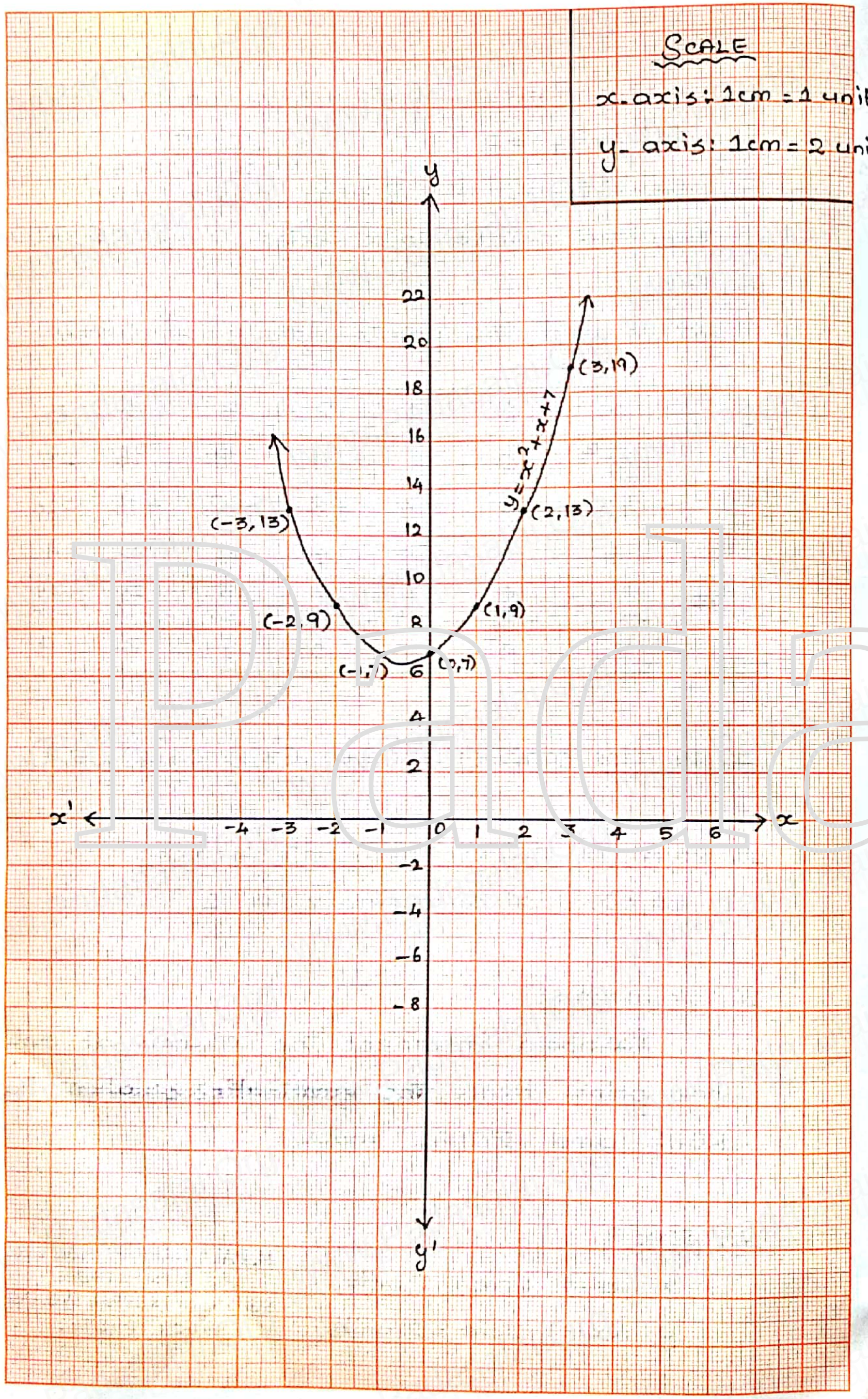
Parabola intersect the x axis at only one point. Hence, the equation $x^2-4x+4=0$ has REAL and EQUAL roots.

V. SCALE:

x axis: 1cm = 1 unit

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed.
B.T. Assistant (Maths)
SGHSS, NERKUPPAI, SVG. Dist
99429 04874.



⑥ Discuss the nature of solutions: $x^2+x+7=0$

Ex 3.15 1 (iii) Pg. 132.

Soln: $x^2+x+7=0$

No solution.

$$\begin{array}{c|l} 7 & 1 \\ 1 & 7 = 8 \times \\ 7 & 1 = 8 \times \end{array}$$

Hence, required points in x axis is (−3 to 3) 7 points

I. TABLE:

Let us find the points for $y = x^2+x+7$

x	−3	−2	−1	0	1	2	3
x^2	9	4	1	0	1	4	9
x	−3	−2	−1	0	1	2	3
7	7	7	7	7	7	7	7
Tot y $\pm$	16 −3	11 −2	8 −1	7 0	9 0	13 0	19 0
y	13	9	7	7	9	13	19

II. POINTS: (−3, 13) (−2, 9) (−1, 7) (0, 7) (1, 9) (2, 13) (3, 19)

III. POINT OF INTERSECTION with x axis:

Does not intersect x axis

IV. SOLUTIONS:

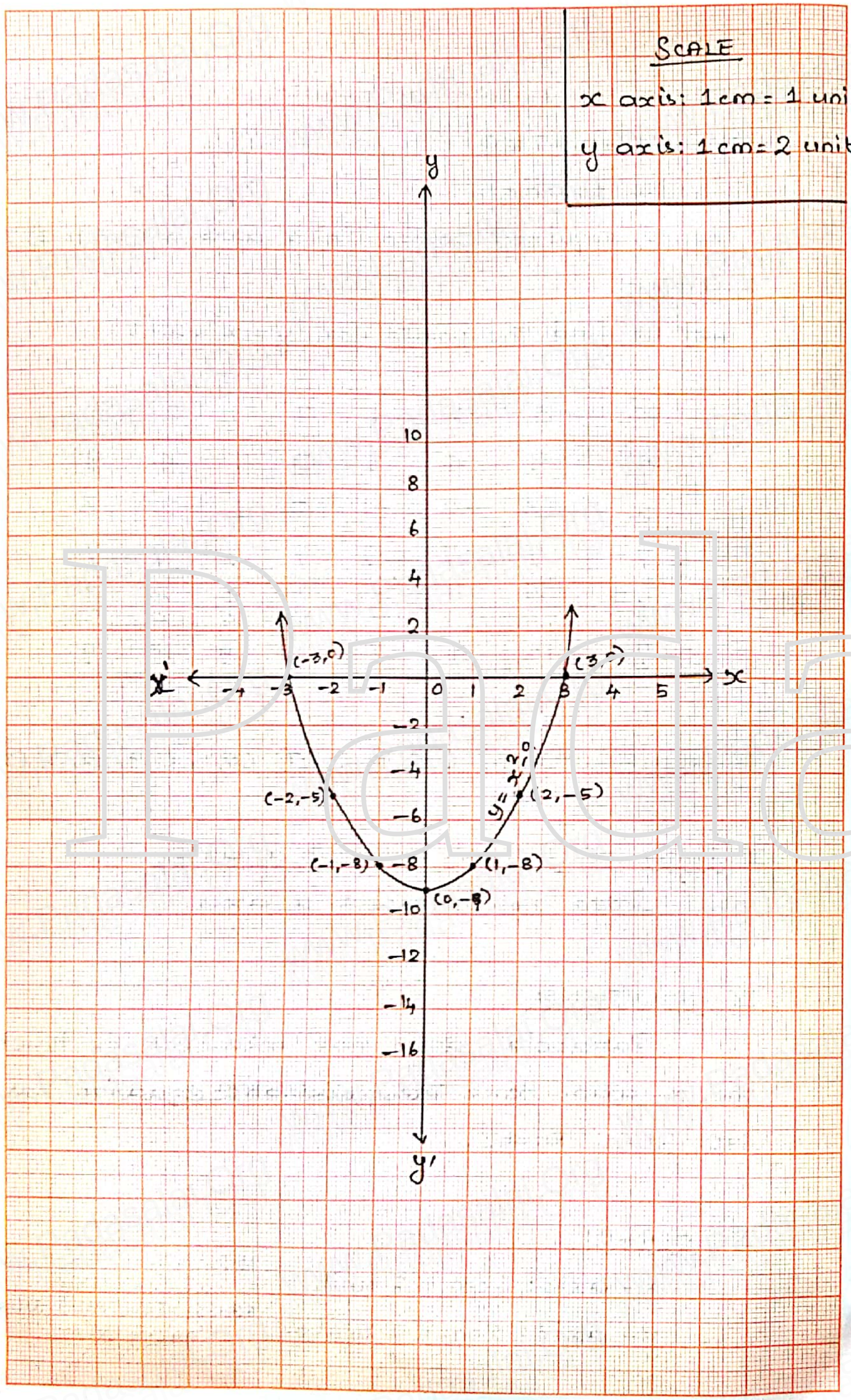
Parabola does not intersect or touch the x-axis. Hence the equation $x^2+x+7=0$ has NO REAL Roots.

V. SCALE:

x-axis: 1 cm = 1 unit

y-axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed.,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



7) Ex: 3.15 1(v) Pg: 132.

Discuss the nature of solutions: $x^2 - 9 = 0$

Soln: $x^2 - 9 = 0$

$(x+3)(x-3) = 0$

$\therefore x = -3, +3$. Required points -3 to 3 (7 points)

I. TABLE:

Let us find the points of $y = x^2 - 9$.

x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
-9	-9	-9	-9	-9	-9	-9	-9.
y	0	-5	-8	-9	-8	-5	0

II. POINTS: $(-3,0)$ $(-2,-5)$ $(-1,-8)$ $(0,-9)$ $(1,-8)$ $(2,-5)$ $(3,0)$

III. POINTS OF INTERSECTION with x axis:

$(-3,0)$ and $(3,0)$. x coordinates -3 and 3.

IV. SOLUTION:

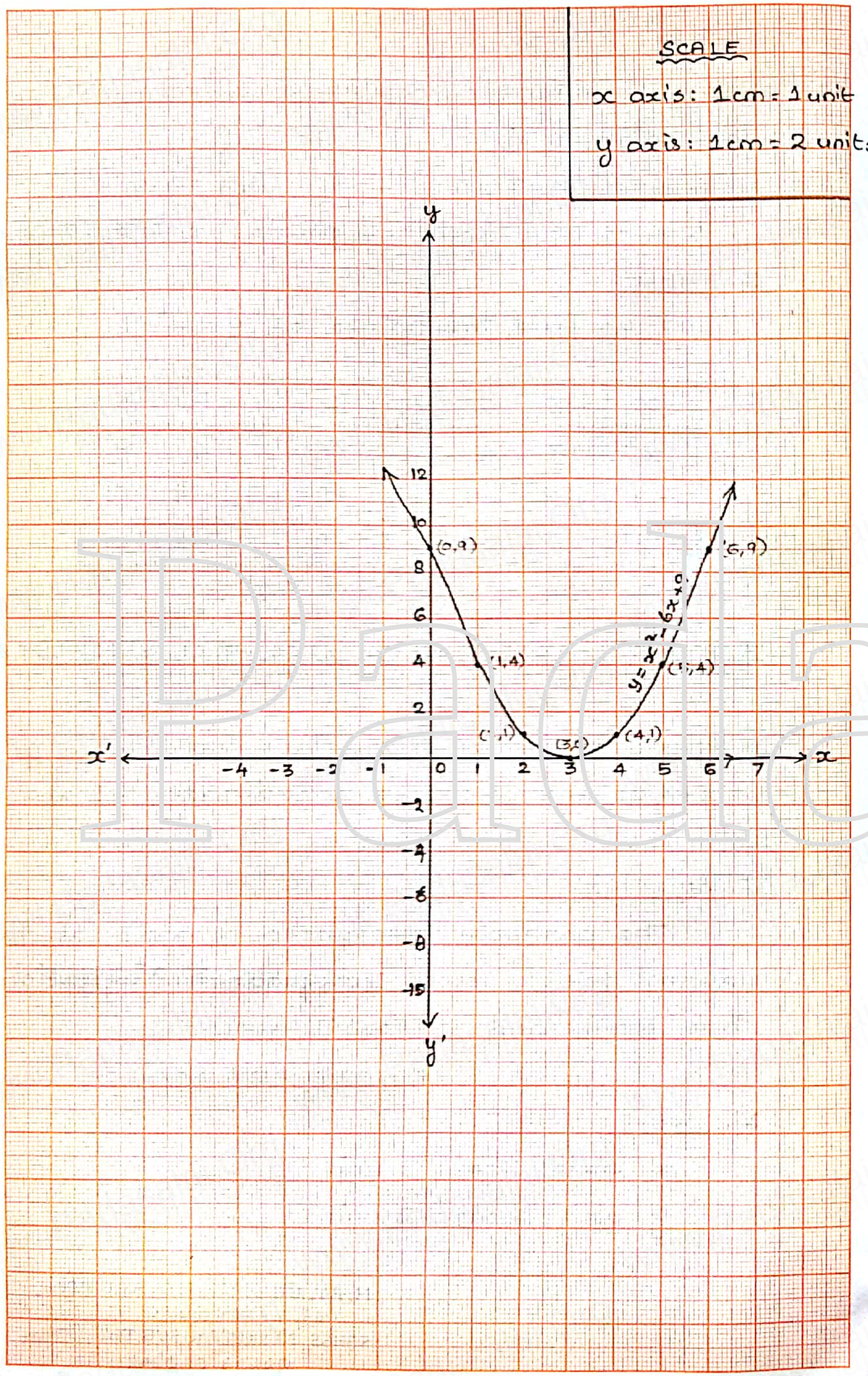
The parabola intersects x axis at two distinct points. Hence the equation $x^2-9=0$ has REAL and UNEQUAL roots.

V. SCALE:

x axis: 1 cm = 1 unit.

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed., MPhil,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



Ex: 3.15 1 (v) Pg: 132.

8) Discuss the nature of solutions: $x^2 - 6x + 9 = 0$

Soln: $x^2 - 6x + 9 = 0$

$(x-3)(x-3) = 0 \quad \therefore x = 3, 3.$

$9 \mid -6$; $-1, -9 = -10$ ×; $-3, -3 = -6$ ✓

Required points: 0 – 6 (7 points)

I. TABLE:

Let us find the points for $y = x^2 - 6x + 9$.

x	0	1	2	3	4	5	6
x^2	0	1	4	9	16	25	36
$-6x$	0	-6	-12	-18	-24	-30	-36
9	9	9	9	9	9	9	9
Total: +	9	10	13	18	25	34	45
–	0	-6	-12	-18	-24	-30	-36
y	9	4	1	0	1	4	9

II. POINTS: (0,9), (1,4), (2,1), (3,0), (4,1), (5,4), (6,9)

III. POINTS OF INTERSECTION with x-axis:

(3, 0). x co-ordinate is 3.

IV. SOLUTION:

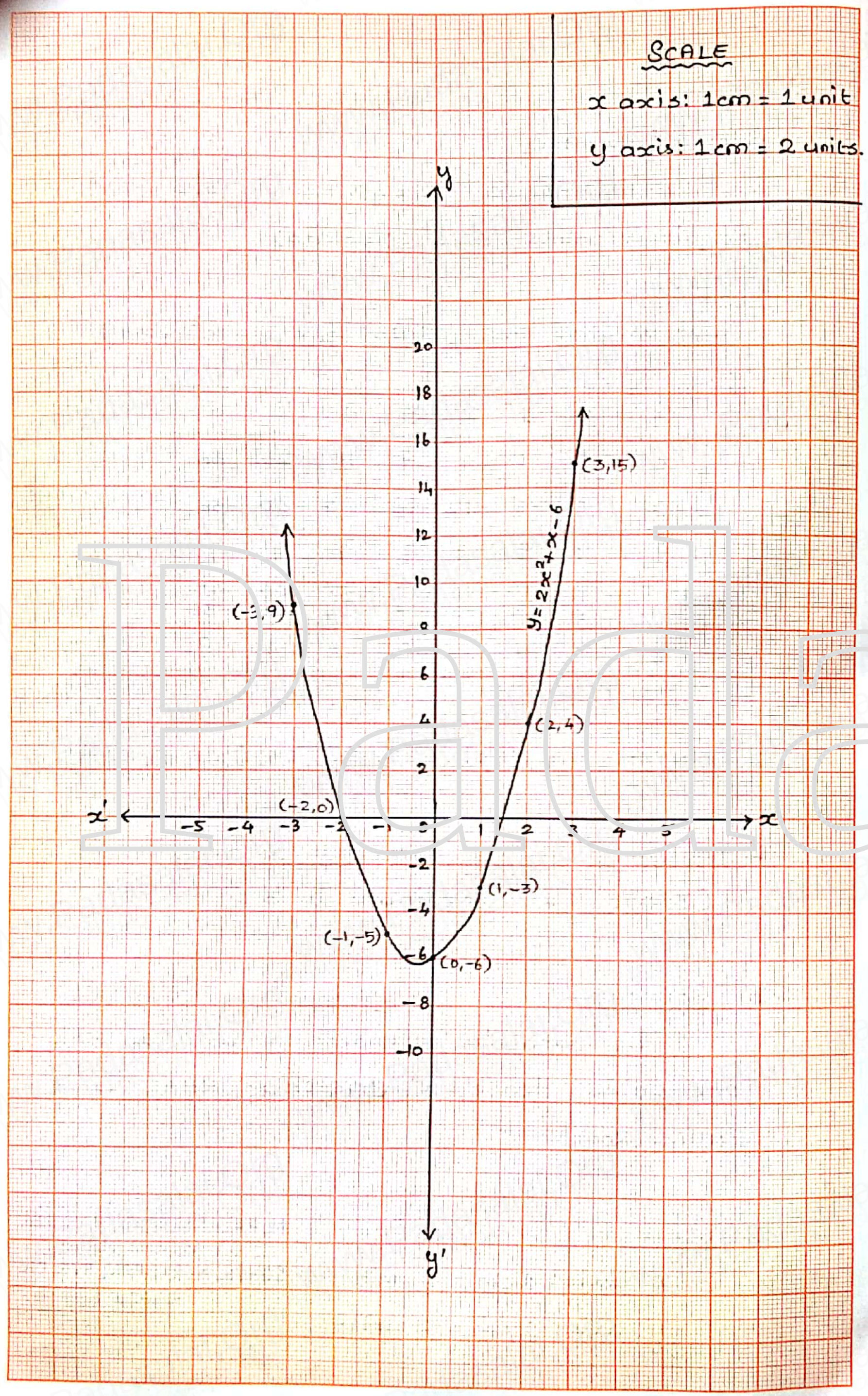
The parabola intersect x axis at only one point. Hence, $x^2 - 6x + 9 = 0$ has REAL and EQUAL Roots.

V. SCALE:

x axis: 1 cm = 1 unit

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed.,
B.T. Assistant (Maths)
SGHSS., NERKUPPAL SVG. Dist
99429 04874.



(9) Ex. 3.15 1 (vi) Pg. 132.

Discuss the nature of solution: $(2x-3)(x+2)=0$

Soln: $(2x-3)(x+2)=0 \Rightarrow 2x^2+4x-3x-6 = 2x^2+x-6=0$.

$2x-3=0 \Rightarrow 2x=3 \Rightarrow x = 3/2 = 1.5$

$x+2=0 \Rightarrow x=-2 \quad \therefore x = -2, 1.5$.

Required points: -3 to 3. (7 points).

I. TABLE:

Let us find the points for $y = 2x^2+x-6$.

x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
$2x^2$	18	8	2	0	2	8	18
x	-3	-2	-1	0	1	2	3
-6	-6	-6	-6	-6	-6	-6	-6
Tot: +	18	8	2	0	3	10	21
−	-9	-8	-7	-6	-6	-6	-6
y	9	0	-5	-6	-3	4	15

II. POINTS:

$(-3,9), (-2,0), (-1,-5), (0,-6), (1,-3), (2,4), (3,15)$

III. POINTS OF INTERSECTION with x-axis:

$(-2,0)$ and $(1.5,0)$ x co-ordinates $-2, 1.5$.

IV. SOLUTION:

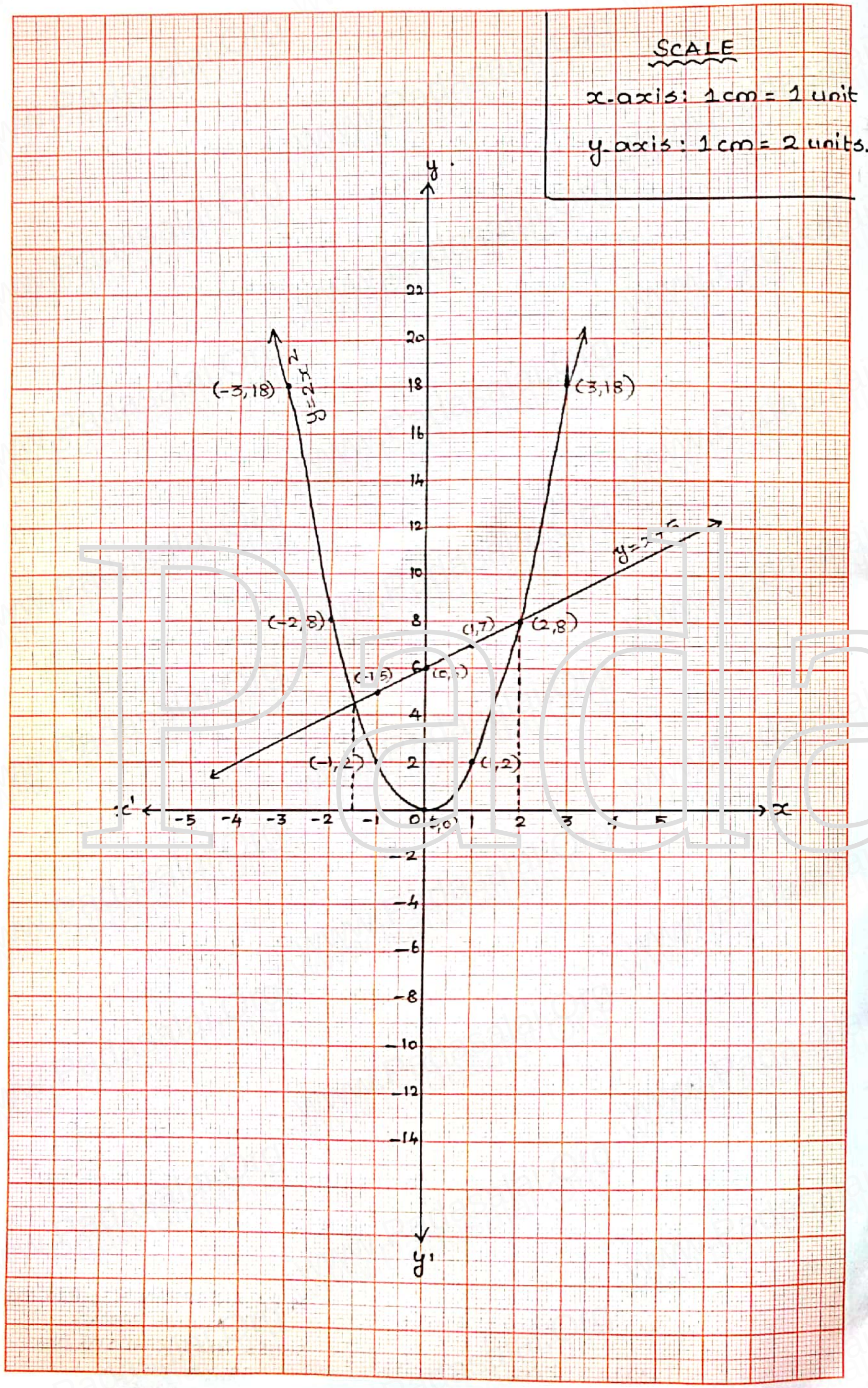
The parabola intersects x axis at TWO distinct points. Hence, the equation $(2x-3)(x+2)=0$ has REAL and UNEQUAL Roots.

V. SCALE:

x axis: 1 cm = 1 unit

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed., MPhil,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



(10) Draw the graph of $y = 2x^2$ and hence solve $2x^2 - x - 6 = 0$

Example 3.49 Pg.130

Soln:

$2x - 6$

$-12 \mid -1$

$1 \mid -12 = -11$ ✗ $\quad \frac{3}{2}$

$2 \mid -6 = -4$ ✗ $\quad -\frac{4}{2} = -2$

$3 \mid -4 = -1$ ✓

$2x^2 - x - 6 = 0 \Rightarrow (2x+3)(x-2) = 0$

$\therefore 2x = -3, \Rightarrow x = -3/2 = -1.5, \; x = 2.$

$\therefore x = -1.5, 2.$ Required points: -3 to 3 (7 points).

I. TABLE-1: (Parabola)

Let us find the points of $y = 2x^2$

x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
$y = 2x^2$	18	8	2	0	2	8	18

II. POINTS: (−3,18), (−2,8), (−1,2), (0,0), (1,2), (2,8), (3,18)

III. TABLE-2: (Straight Line).

$$y = 2x^2$$
$$0 = 2x^2 - x - 6$$
$$(-) \quad\quad (-) \; (+) \; (+)$$
$$y = x + 6.$$

Let us find the points of $\boxed{y = x+6}$

$x = -1 \Rightarrow y = -1+6 = 5$ (−1,5)

$x = 0 \Rightarrow y = 0+6 = 6$ (0,6)

$x = 1 \Rightarrow y = 1+6 = 7$ (1,7)

IV. POINTS: (−1,5) (0,6) (1,7)

V. POINT OF INTERSECTION:

(−1.5, 4.5) and (2,8). x coordinates: −1.5, 2.

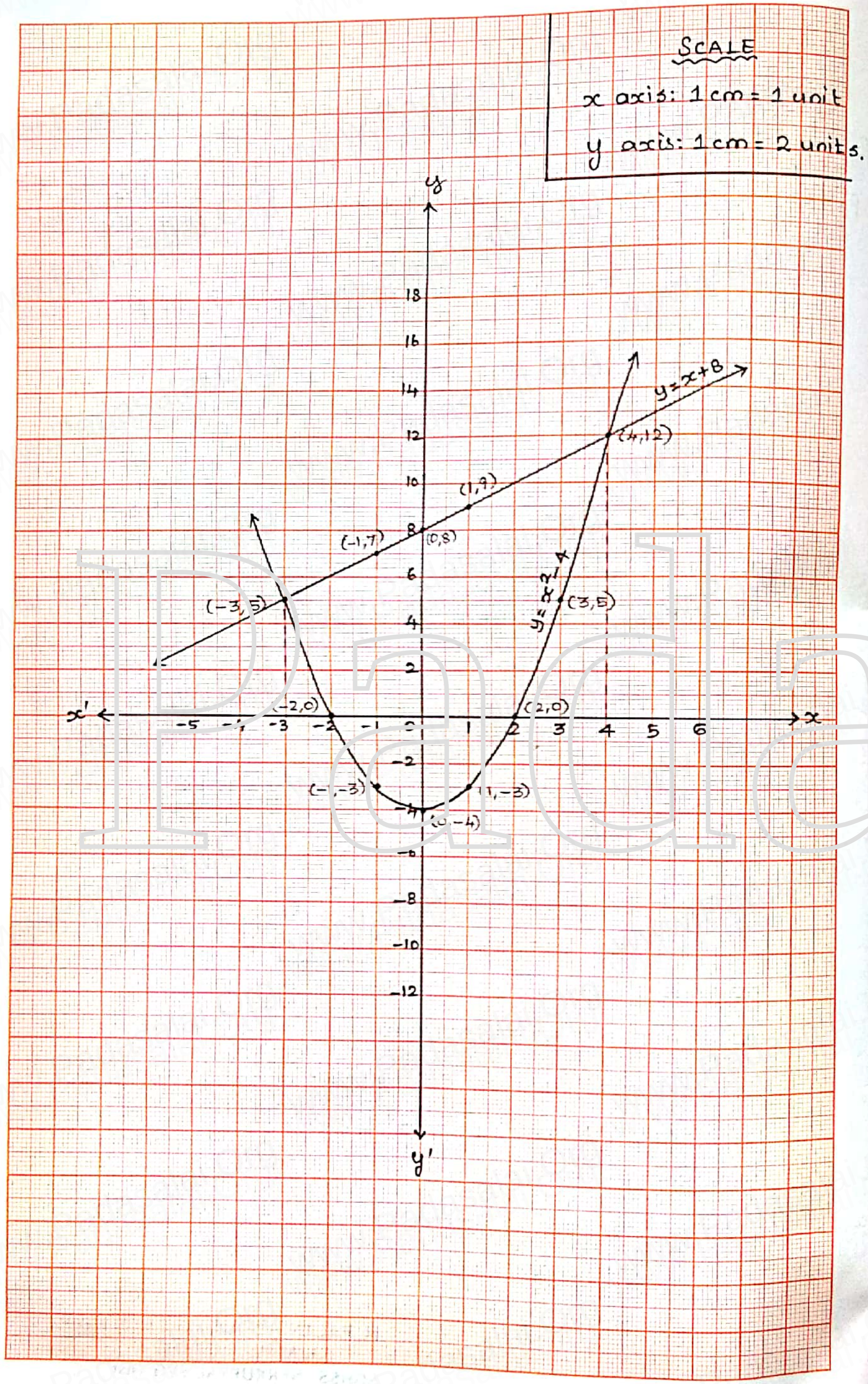
VI. SOLUTION: $x = -1.5$ and 2.

VII. SCALE:

x axis: 1 cm = 1 unit.

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed., MPhil,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



(11) Draw the graph of $y = x^2 - 4$ and hence solve $x^2 - x - 12 = 0$.

Ex 3.15 (2) Pg: 132

Soln: $x^2 - x - 12 = 0 \Rightarrow (x+3)(x-4) = 0$

-12	-1
1	$-12 = -11$ ✗
2	$-6 = -4$ ✗
3	$-4 = -1$ ✓

$\therefore x = -3, 4$. Reqd. points -3 to 4 (8 points)

I. TABLE-1: Parabola

Let us find the points of $y = x^2 - 4$.

x	-3	-2	-1	0	1	2	3	4
x^2	9	4	1	0	1	4	9	16
-4	-4	-4	-4	-4	-4	-4	-4	-4
y	5	0	-3	-4	-3	0	5	12

II. POINTS: $(-3,5)$, $(-2,0)$ $(-1,-3)$, $(0,-4)$ $(1,-3)$ $(2,0)$ $(3,5)$, $(4,12)$.

III. TABLE-2: Straightline.

$$y = x^2 - 4$$
$$0 = \overset{(-)}{x^2} \overset{(+)}{-} x \overset{(+)}{-} 12$$
$$y = x + 8$$

Points of $y = x + 8$ are...

$x = -1 \Rightarrow y = -1 + 8 = 7$. $(-1, 7)$

$x = 0 \Rightarrow y = 0 + 8 = 8$ $(0, 8)$

$x = 1 \Rightarrow y = 1 + 8 = 9$ $(1, 9)$

IV. POINT OF INTERSECTION:

$(-3,5)$ and $(4,12)$. x co-ordinates: $-3, 4$.

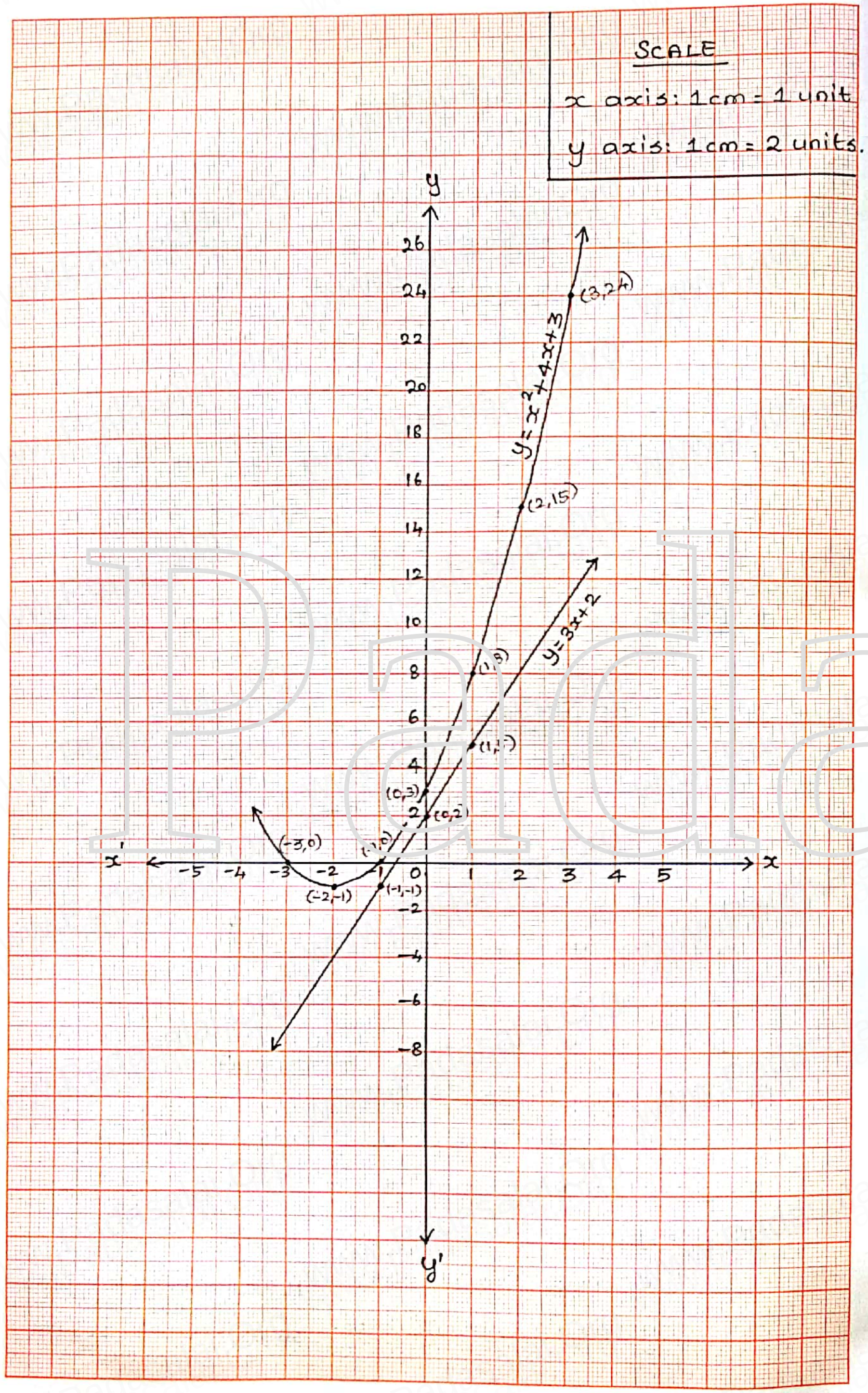
V. SOLUTION: $x = -3$ and 4

VI. SCALE:

x axis: 1 cm = 1 unit

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed., M.Phil,
B.T. Assistant (Maths)
SGHSS, NERKUPPAI, SVG. Dist
99429 04874.



(12) Example 3.50 Pg: 350.

Draw the graph of $y = x^2+4x+3$ and hence find the roots of $\underline{x^2+x+1=0}$

Soln: $x^2+x+1=0$ has no solution. $\frac{1|1}{1|1} = 2\times$

$\therefore$ Reqd. points: -3 to 3 (7 points).

I. TABLE-1: Parabola

Let us find the points for $y = x^2+4x+3$.

x	-3	-2	-1	0	1	2	$3.$
x^2	9	4	1	0	1	4	9
$4x$	-12	-8	-4	0	4	8	12
3	3	3	3	3	3	3	3
Tot: +ve / −ve	12 / −12	7 / −8	4 / −4	3 / 0	8 / 0	15 / 0	24 / 0
y	0	-1	0	3	8	15	24.

II. POINTS: $(-3,0), (-2,-1)\ (-1,0)\ (0,3)\ (1,8)\ (2,15)\ (3,24)$

III. TABLE-2: Straight Line

$$y = x^2+4x+3 \quad (-)$$
$$\underline{0 = x^2+x+1}$$
$$y = 3x+2$$

$x=-1 \Rightarrow y = 3\times(-1)+2 = -3+2 = -1$ | $(-1,-1)$

$x=0 \Rightarrow y = 3\times 0+2 = 0+2 = 2$ | $(0,2)$

$x=1 \Rightarrow y = 3\times 1+2 = 3+2 = 5$ | $(1,5)$.

IV. POINTS: $(-1,-1),\ (0,2),\ (1,5)$

V. POINT OF INTERSECTION:

Does not intersect.

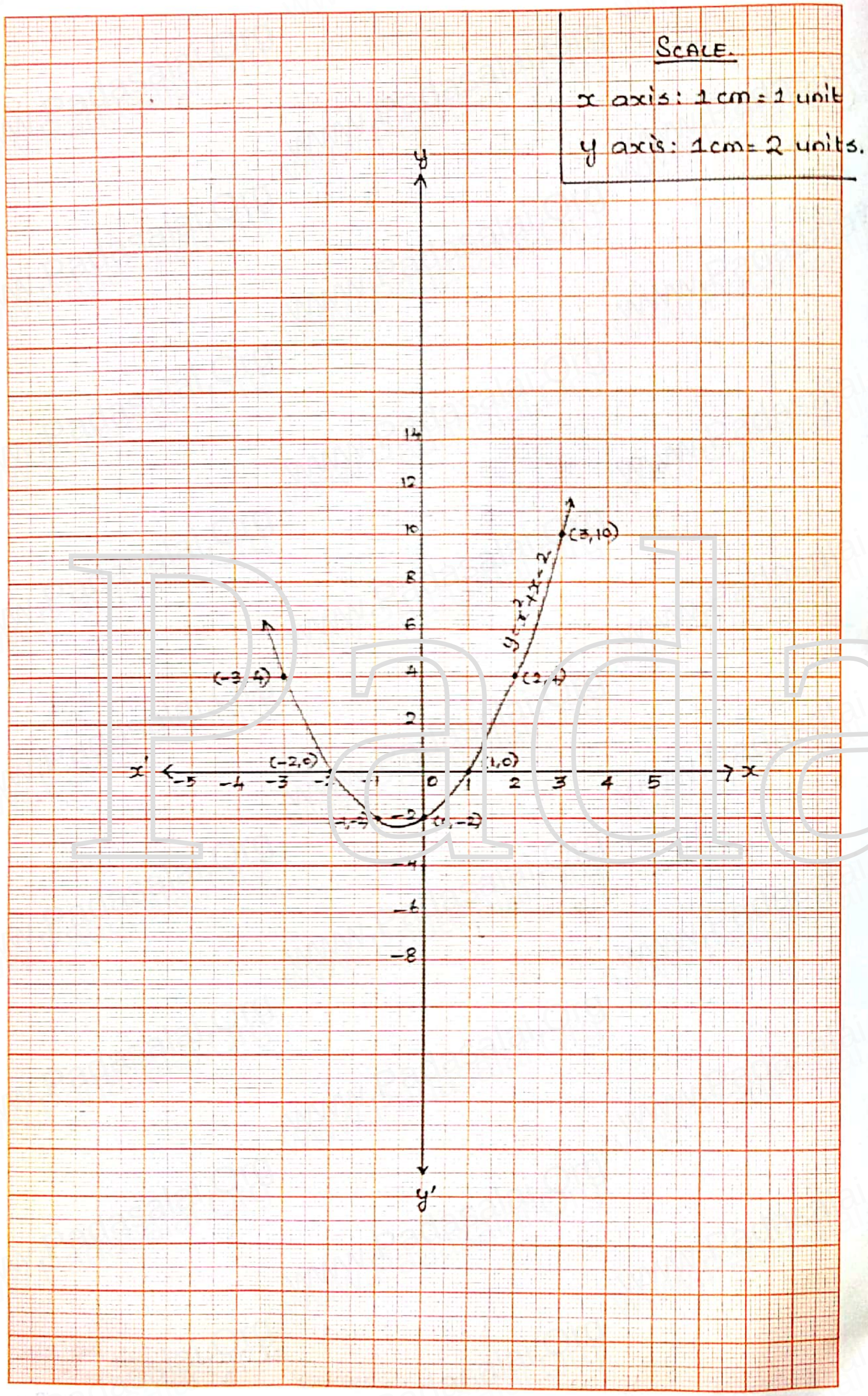
VI. SOLUTION: No solution. Roots are UNREAL.

VII. SCALE:

x axis: 1 cm = 1 unit.

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed.,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



(13) Draw the graph of $y=x^2+x-2$ and hence solve $x^2+x-2=0$.

Example: 3.51
Pg: 131

$\begin{array}{c|l} -2 & 1 \\ 1 & -2=-1 \times \\ 2 & -1=1 \checkmark \end{array}$

Soln: $x^2+x-2=0 \Rightarrow (x+2)(x-1)=0$

$\therefore x=-2, 1.$ Reqd. points -3 to 3 (7 points).

I. TABLE-1: Parabola.

Let us find the points for $y=x^2+x-2$.

x	-3	-2	-1	0	1	2	$3.$
x^2	9	4	1	0	1	4	9
x	-3	-2	-1	0	1	2	3.
-2	-2	-2	-2	-2	-2	-2	-2
Tot: +ve / -ve	9 / -5	4 / -4	1 / -3	0 / -2	2 / -2	6 / -2	12 / -2
y	4	0	-2	-2	0	4	10

II. POINTS: $(-3,4), (-2,0), (-1,-2), (0,-2), (1,0), (2,4), (3,10)$

III. TABLE-2: Straight line.

$$\begin{array}{l} y = x^2+x-2 \quad (-) \\ 0 = \overset{(-)}{x^2} \overset{(-)}{+x} \overset{(+)}{-2} \\ \hline y = 0 \end{array} \Rightarrow x \text{ axis.}$$

IV. POINT OF INTERSECTION:-

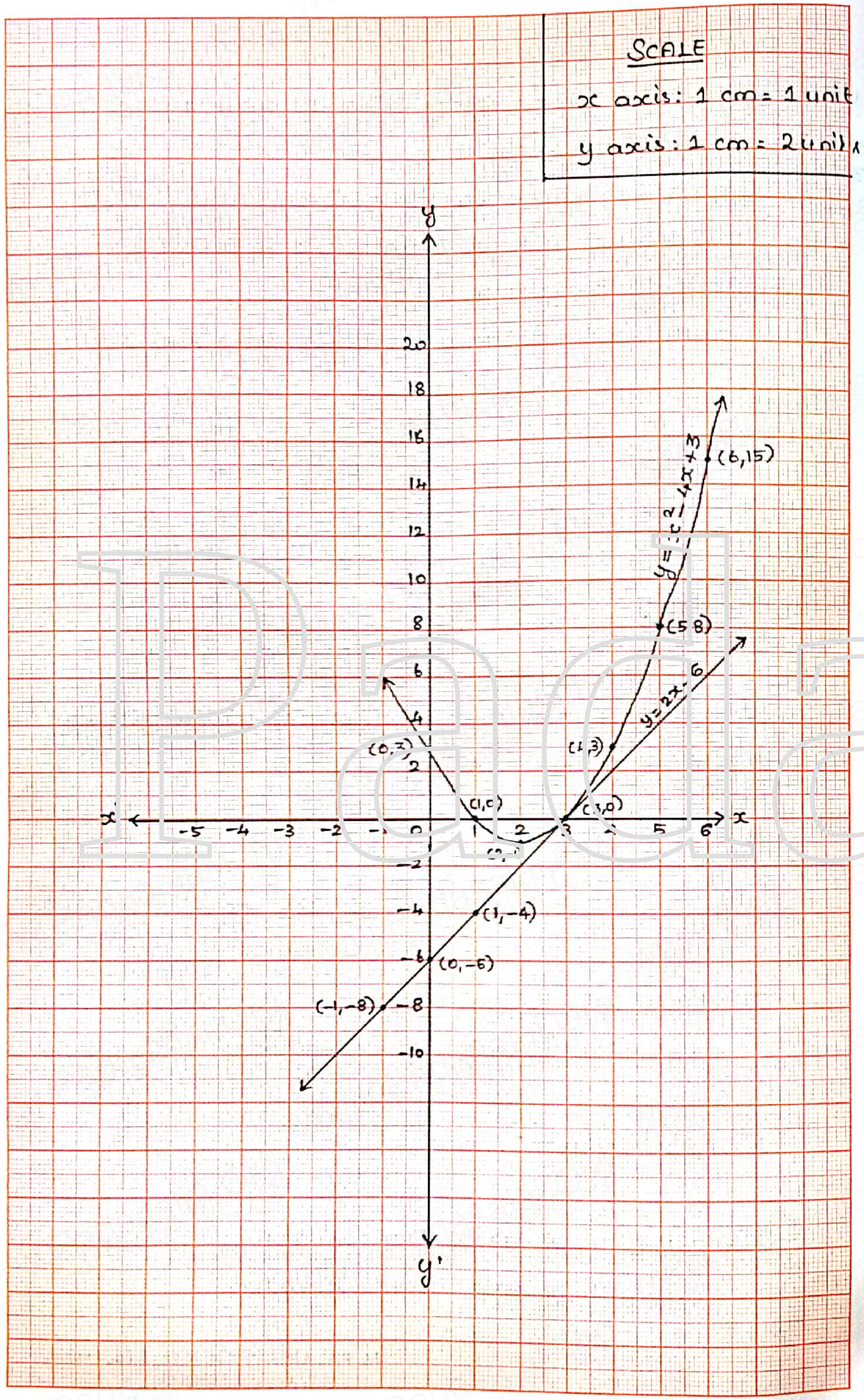
$(-2,0)$ and $(1,0)$. x coordinates: -2 and 1.

V. Solution: $x=-2$ and 1.

VI. SCALE: x axis: 1 cm = 1 unit

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed., M.Phil.,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



(14) Draw the graph of $y = x^2 - 4x + 3$ and use it to solve $x^2 - 6x + 9 = 0$.

Example 3.52. (131)

Soln: $x^2 - 6x + 9 = 0 \Rightarrow (x-3)(x-3) = 0$

$\therefore x = 3, 3.$ Required points: 0-6

9 | -6
-1 | -9 = -10
-3 | -3 = -6 ✓.

I. TABLE-1: (Parabola)

Let us find the points for $y = x^2 - 4x + 3$.

x	0	1	2	3	4	5	6.
x^2	0	1	4	9	16	25	36.
$-4x$	0	-4	-8	-12	-16	-20	-24
3	3	3	3	3	3	3	3.
Tot: +ve / -ve.	3 / 0	4 / -4	7 / -8	12 / -12	19 / -16	28 / -20	39 / -24
y	3	0	-1	0	3	8	15

II. POINTS: (0,3), (1,0), (2,-1), (3,0), (4,3), (5,8), (6,15)

III. TABLE-2: (Straight line).

$$y = x^2 - 4x + 3 \; (-)$$
$$0 = x^2 - 6x + 9$$
$$y = 2x - 6$$

$x = -1 \Rightarrow y = 2(-1) - 6 = -2 - 6 = -8$ (-1, -8)

$x = 0 \Rightarrow y = 2(0) - 6 = 0 - 6 = -6$ (0, -6)

$x = 1 \Rightarrow y = 2(1) - 6 = 2 - 6 = -4$ (1, -4)

IV. POINTS: (-1,-8), (0,-6), (1,-4).

V. POINT OF INTERSECTION:

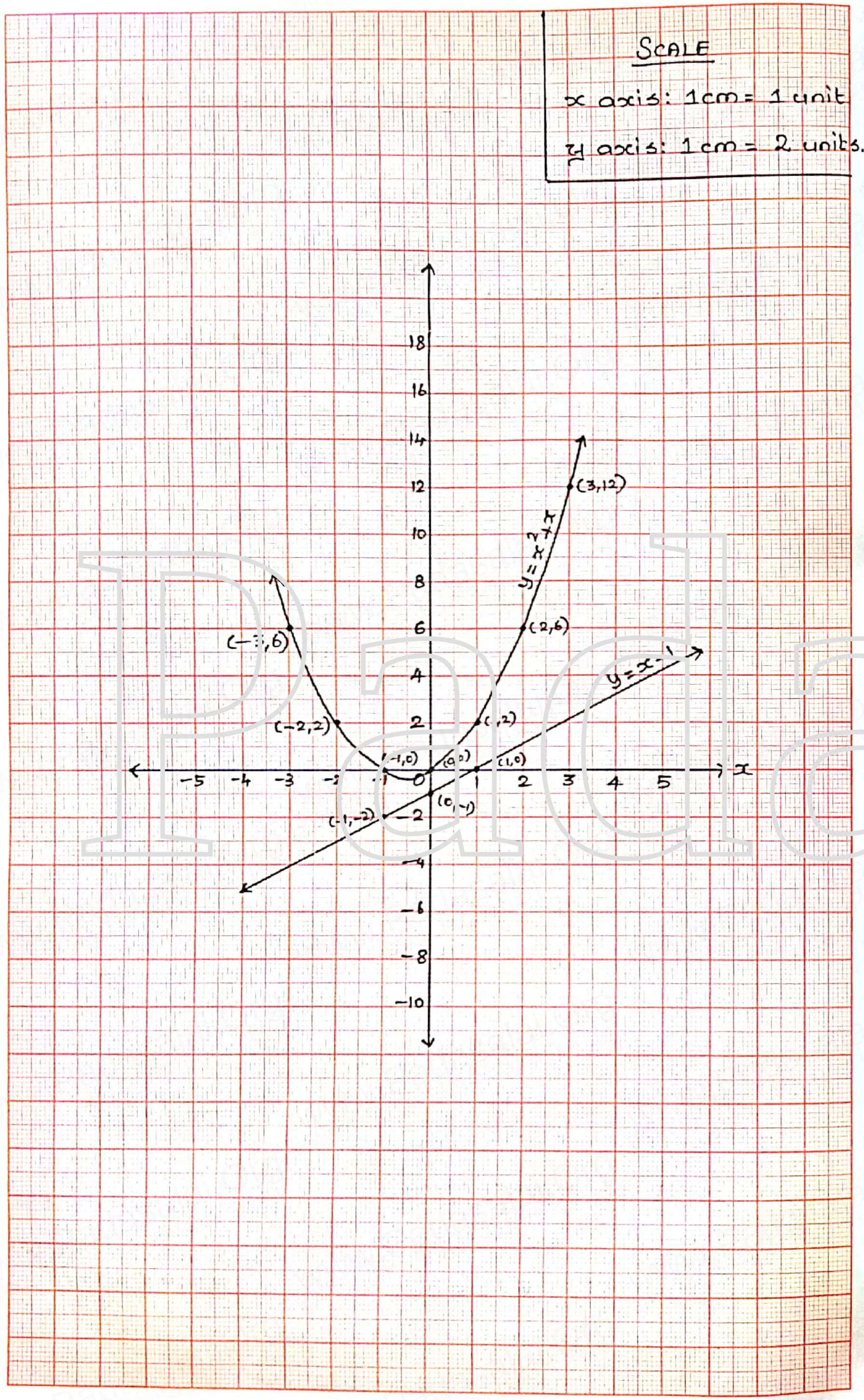
(3, 0). x - co-ordinate 3.

VI. SOLUTION: $x = 3$.

VII. SCALE: x axis: 1cm = 1 unit.

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed.,
B.T. Assistant (Maths)
SGHSS., NERKUPPAL, SVG. Dist
99429 04874.



(15) Draw the graph of $y = x^2+x$ and hence solve $x^2+1=0$

Ex 3.15 (3) Pg.132

Soln: $x^2+1=0$ has no solution.

$\begin{array}{c|c} 1 & 0 \\ 1 & 1 = 2X \end{array}$

Hence Required points are -3 to 3 (7 points).

I. TABLE-1: (Parabola)

Let us find the point for $y = x^2+x$.

x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
x	-3	-2	-1	0	1	2	3
y	6	2	0	0	2	6	12

II. POINTS: $(-3,6), (-2,2)\ (-1,0), (0,0), (1,2), (2,6)\ (3,12)$

III. TABLE-2: (Straight Line)

$$y = x^2+x \quad (-)$$
$$0 = \overset{(-)}{x^2} \overset{(-)}{+1}$$
$$y = \quad x-1.$$

$x=-1 \Rightarrow y = -1-1 = -2$ $\quad (-1,-2)$

$x=0 \Rightarrow y = 0-1 = -1$ $\quad (0,-1)$

$x=1 \Rightarrow y = 1-1 = 0$ $\quad (1,0)$

IV. POINTS: $(-1,-2), (0,-1)\ (1,0)$.

V. POINT OF INTERSECTION:

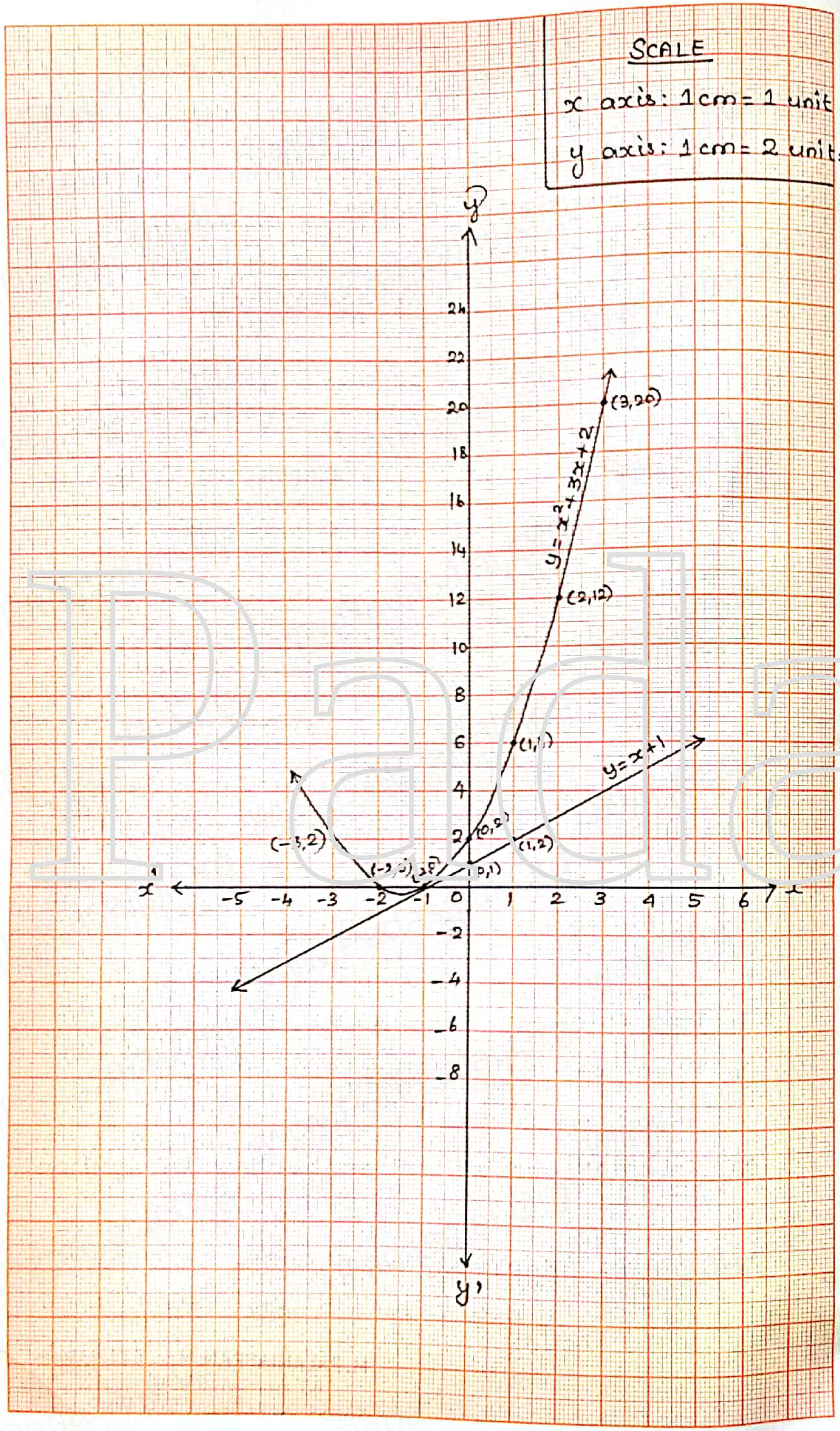
Does not intersect

VI. SOLUTION: Has no real roots. Hence no solution.

VII. SCALE: x axis: 1 cm = 1 units.

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed., M.Phil.
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



Exercise 3.15 (4) Pg:132.

(16) Draw the graph of $y = x^2+3x+2$ and use it to solve $x^2+2x+1=0$.

Soln: $x^2+2x+1=0 \Rightarrow (x+1)(x+1)=0$

$\therefore x = -1, -1$. $\therefore$ Reqd. points: -3 to 3 (7 points)

I. TABLE-1: (Parabola).

Let us find the points for $y = x^2+3x+2$.

x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
$3x$	-9	-6	-3	0	3	6	9
2	2	2	2	2	2	2	2
Tot. +ve	11	6	3	2	6	12	20
Tot. −ve	-9	-6	-3	0	0	0	0
y	2	0	0	2	6	12	20

II. POINTS: $(-3,2), (-2,0), (-1,0), (0,2), (1,6), (2,12), (3,20)$

III. TABLE-2: (Straight Line)

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

$x=-1 \Rightarrow y=-1+1=0$ $\quad (-1,0)$

$x=0 \Rightarrow y=0+1=1$ $\quad (0,1)$

$x=1 \Rightarrow y=1+1=2$ $\quad (1,2)$

IV. POINTS: $(-1,0), (0,1), (1,2)$.

V. POINT OF INTERSECTION:

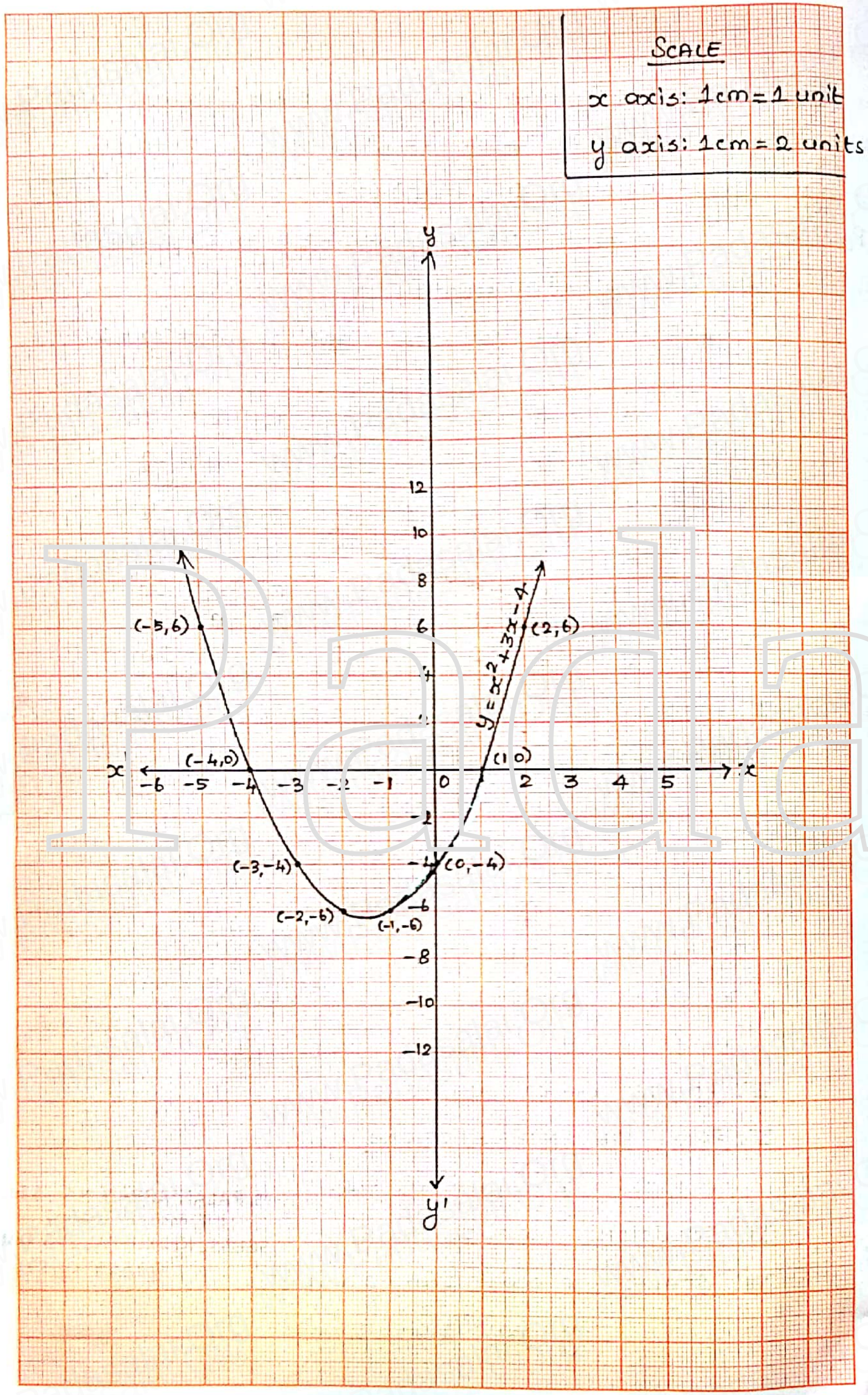
$(-1,0)$. x coordinate -1.

VI. SOLUTION: $x = -1$.

VII. SCALE: x axis: 1cm = 1 unit.

y axis: 1cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed.,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874



(17) Exercise 3.15 (5) Pg. 132

Draw the graph of $y = x^2+3x-4$ and hence use it to solve $x^2+3x-4=0$.

Soln: $x^2+3x-4=0 \Rightarrow (x+4)(x-1)=0$

$$\begin{array}{r|l} -4 & 3 \\ \hline 1 & -4 = -3 \times \\ 4 & -1 = 3 \checkmark \end{array}$$

$\therefore x = -4, 1$. Reqd. points: -5 to 2

I. TABLE-1: (Parabola)

Let us find the points for $y = x^2+3x-4$.

x	-5	-4	-3	-2	-1	0	1	2
x^2	25	16	9	4	1	0	1	4
$3x$	-15	-12	-9	-6	-3	0	3	6
-4	-4	-4	-4	-4	-4	-4.	-4	-4
Tot. +ve / −ve	25 / -19	16 / -16	9 / -13	4 / -10	1 / -7	0 / -4.	4 / -4	10 / -4
y	6	0	-4	-6	-6	-4.	0	6.

II. POINTS: $(-5,6), (-4,0), (-3,-4), (-2,-6), (-1,-6), (0,-4)$, $(1,0), (2,6)$.

III. TABLE-2: (Straight Line)

$$\begin{aligned} y &= x^2+3x-4 \\ 0 &= \overset{(-)}{x^2} \overset{(-)}{+3x} \overset{(+)}{-4} \\ \hline y &= 0 \quad \leftarrow (x \text{ axis}) \end{aligned}$$

IV. POINTS: $(-1,0), (0,0), (1,0)$.

V. POINT OF INTERSECTION:

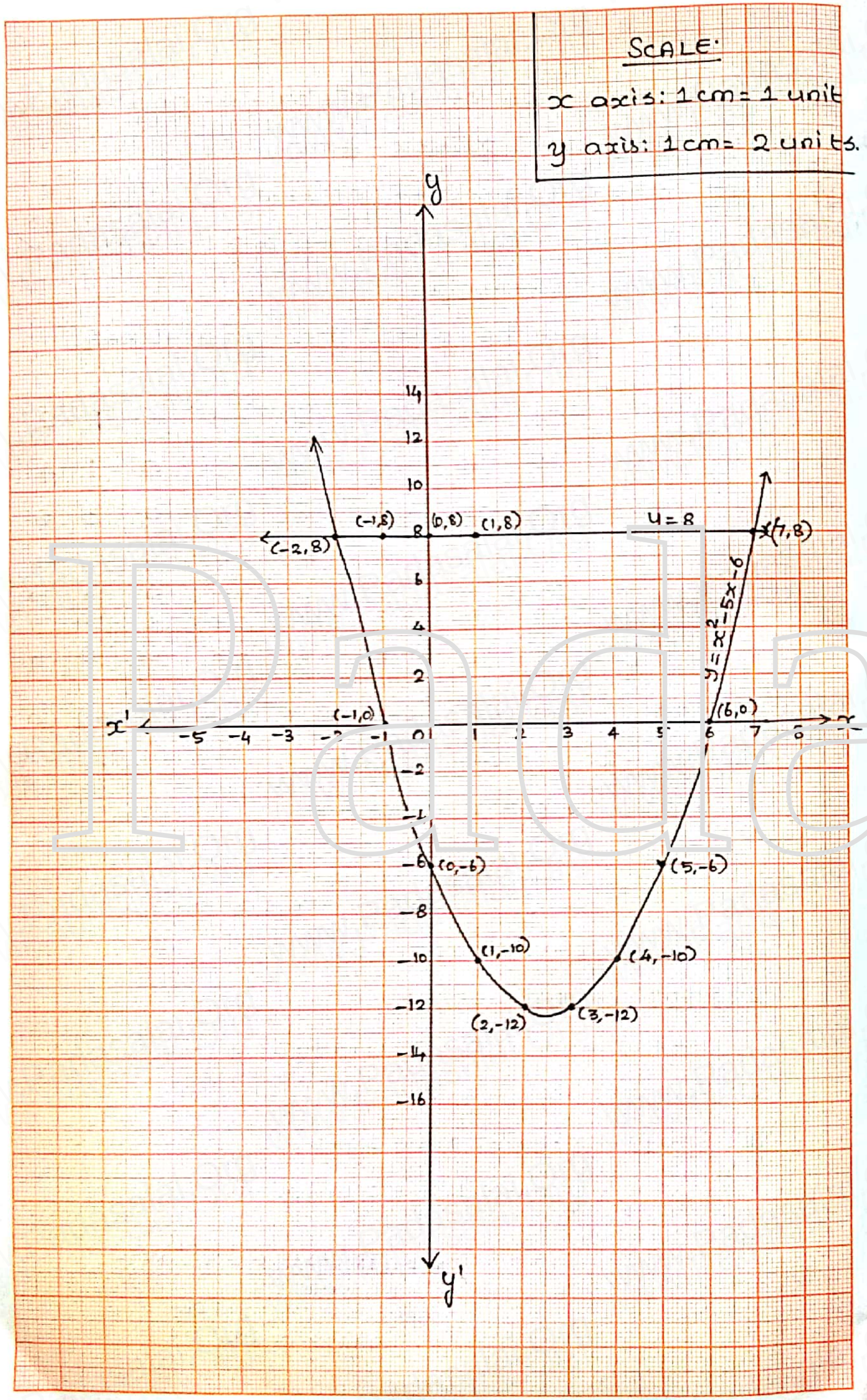
$(-4,0)$ and $(1,0)$. x coordinates $-4, 1$.

VI. SOLUTION: $x = -4, 1$.

VII. SCALE: x axis: 1cm = 1 unit.

y axis: 1cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed., MPhil,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



(18) Ex 3.15 (6) Pg.132

Draw the graph of $y = x^2 - 5x - 6$ and hence solve $x^2 - 5x - 14 = 0$.

Soln: $x^2 - 5x - 14 = 0 \Rightarrow (x+2)(x-7) = 0$

$\therefore x = -2, 7$ Reqd. points: (−2 to 7) (10 points)

-14	-5
1	$-14 = -13$ ✗
2	$-7 = -5$ ✓

I. TABLE-1: Parabola

Let us find the points of $y = x^2 - 5x - 6$.

x	-2	-1	0	1	2	3	4	5	6	7.
x^2	4	1	0	1	4	9	16	25	36	49
$-5x$	+10	+5	0	-5	-10	-15	-20	-25	-30	-35
-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
Tot: +ve / −ve	14 / -6	6 / -6	0 / -6	1 / -11	4 / -16	9 / -21	16 / -26	25 / -31	36 / -36	49 / -41
y	8	0	-6	-10	-12	-12	-10	-6	0	8

II. POINTS: (−2, 8) (−1, 0), (0, −6), (1, −10), (2, −12), (3, −12), (4, −10), (5, −6) (6, 0), (7, 8).

III. TABLE-2: (Straight Line)

$$y = x^2 - 5x - 6$$
$$0 = x^2 - 5x - 14$$
$$y = 8$$

$x = -1$	$\Rightarrow$ $y = 8$	(−1, 8)
$x = 0$	$\Rightarrow$ $y = 8$	(0, 8)
$x = 1$	$\Rightarrow$ $y = 8$	(1, 8)

IV. POINT OF INTERSECTION:

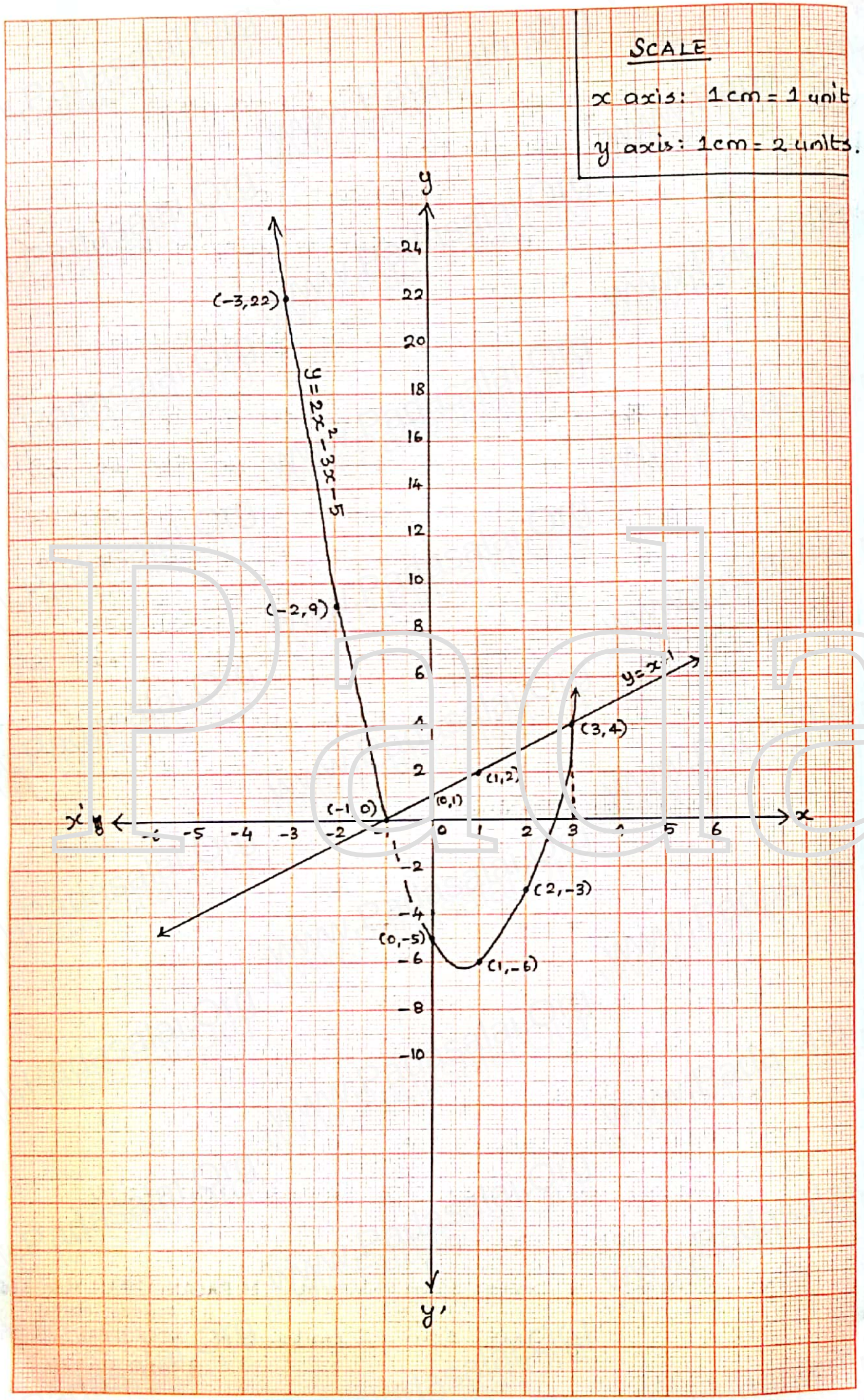
(−2, 8) and (7, 8). x Co-ordinates: −2, 7.

V. SOLUTION: $x = -2, 7$.

VI. SCALE: x axis: 1 cm = 1 unit.

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed.
B.T. Assistant (Maths)
SGHSS, NERKUPPAI, SVG. Dist
99429 04874



19. Ex. 3.15 (7) Pg. 132.

Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$.

Soln: $2x^2 - 4x - 6 = 2(x^2 - 2x - 3) = 0$.

$\therefore x^2 - 2x - 3 = 0 \Rightarrow (x+1)(x-3) = 0$.

$$\begin{array}{c|l} -3 & -2 \\ \hline 1 & -3 = -2 \checkmark \\ 3 & -1 = 2 \times \end{array}$$

I. TABLE-1: (Parabola) $\therefore x = -1, 3$ Points: (−3 to 3) 7 points.

Let us find the points for $y = 2x^2 - 3x - 5$.

x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
$2x^2$	18	8	2	0	2	8	18
$-3x$	9	6	3	0	−3	−6	−9
-5	−5	−5	−5	−5	−5	−5	−5
Tot +ve	27	14	5	0	2	8	18
Tot −ve	−5	−5	−5	−5	−8	−11	−14
y	22	9	0	−5	−6	−3	4

II. POINTS: (−3, 22), (−2, 9), (−1, 0), (0, −5), (1, −6), (2, −3), (3, 4)

III. TABLE-2: (Straight Line)

$$\begin{array}{rl} y = & 2x^2 - 3x - 5 \quad (-) \\ 0 = & \overset{(-)}{2x^2} \overset{(+)}{-} 4x \overset{(+)}{-} 6 \\ \hline y = & x + 1 \end{array}$$

$x = -1 \Rightarrow y = -1 + 1 = 0$. (−1, 0)

$x = 0 \Rightarrow y = 0 + 1 = 1$ (0, 1)

$x = 1 \Rightarrow y = 1 + 1 = 2$ (1, 2)

IV. POINTS: (−1, 0), (0, 1), (1, 2).

V. POINT OF INTERSECTION:

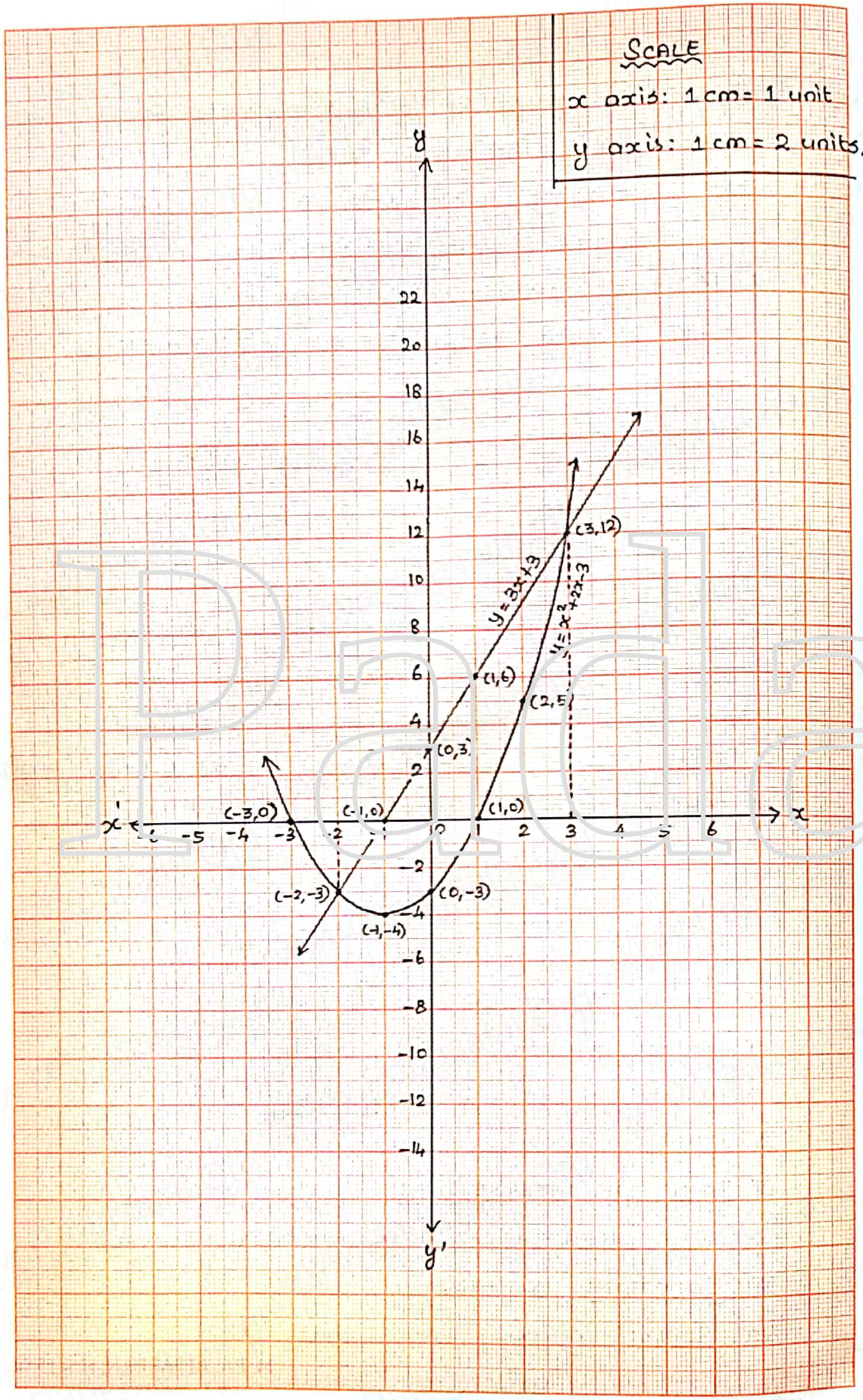
(−1, 0) and (3, 4). x coordinates: −1 and 3.

VI. SOLUTION: $x = -1, 3$.

VII. SCALE: x axis: 1 cm = 1 units.

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed.,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874.



(20) Draw the graph of $y=(x-1)(x+3)$ and hence solve $x^2-x-6=0$.

Ex 3.15 (8) Pg. 132

Soln: $x^2-x-6=0 \Rightarrow (x+2)(x-3)=0$.

-6	-1
1	$-6 = -5$ ✗
2	$-3 = -1$ ✓

$\therefore x=-2, 3$. Reqd. points: -3 to 3 (7 points).

I. TABLE-1: (Parabola)

$y=(x-1)(x+3) = x^2+3x-x-3 = x^2+2x-3$ $\boxed{\therefore y = x^2+2x-3}$

Let us find the points for $y=x^2+2x-3$.

x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
$2x$	-6	-4	-2	0	2	4	6
-3	-3	-3	-3	-3	-3	-3	-3
Tot: +ve / −ve	9 / -9	4 / -7	1 / -5	0 / -3	3 / -3	8 / -3	15 / -3
y	0	-3	-4	-3	0	5	12

II. POINTS: $(-3,0), (-2,-3), (-1,-4), (0,-3), (1,0), (2,5), (3,12)$

III. TABLE-2: (Straight Line).

$$\begin{array}{rl} y = & x^2+2x-3 \\ \overset{(-)}{0} = & \overset{(+)}{x^2} - \overset{(+)}{x} - 6 \\ \hline y = & 3x+3 \end{array}$$

$x=-1 \Rightarrow y = 3(-1)+3 = -3+3 = 0$ $(-1,0)$

$x=0 \Rightarrow y = 3(0)+3 = 0+3 = 3$ $(0,3)$

$x=1 \Rightarrow y = 3(1)+3 = 3+3 = 6$ $(1,6)$

IV. POINTS: $(-1,0), (0,3), (1,6)$

V. POINTS OF INTERSECTION:

$(-2,-3)$ and $(3,12)$. x coordinates -2 and 3.

VI. SOLUTION: $x=-2, 3$.

VII. SCALE: x axis: 1 cm = 1 unit

y axis: 1 cm = 2 units.

M. PALANIAPPAN, M.Sc., B.Ed., M.Phil,
B.T. Assistant (Maths)
SGHSS., NERKUPPAI, SVG. Dist
99429 04874