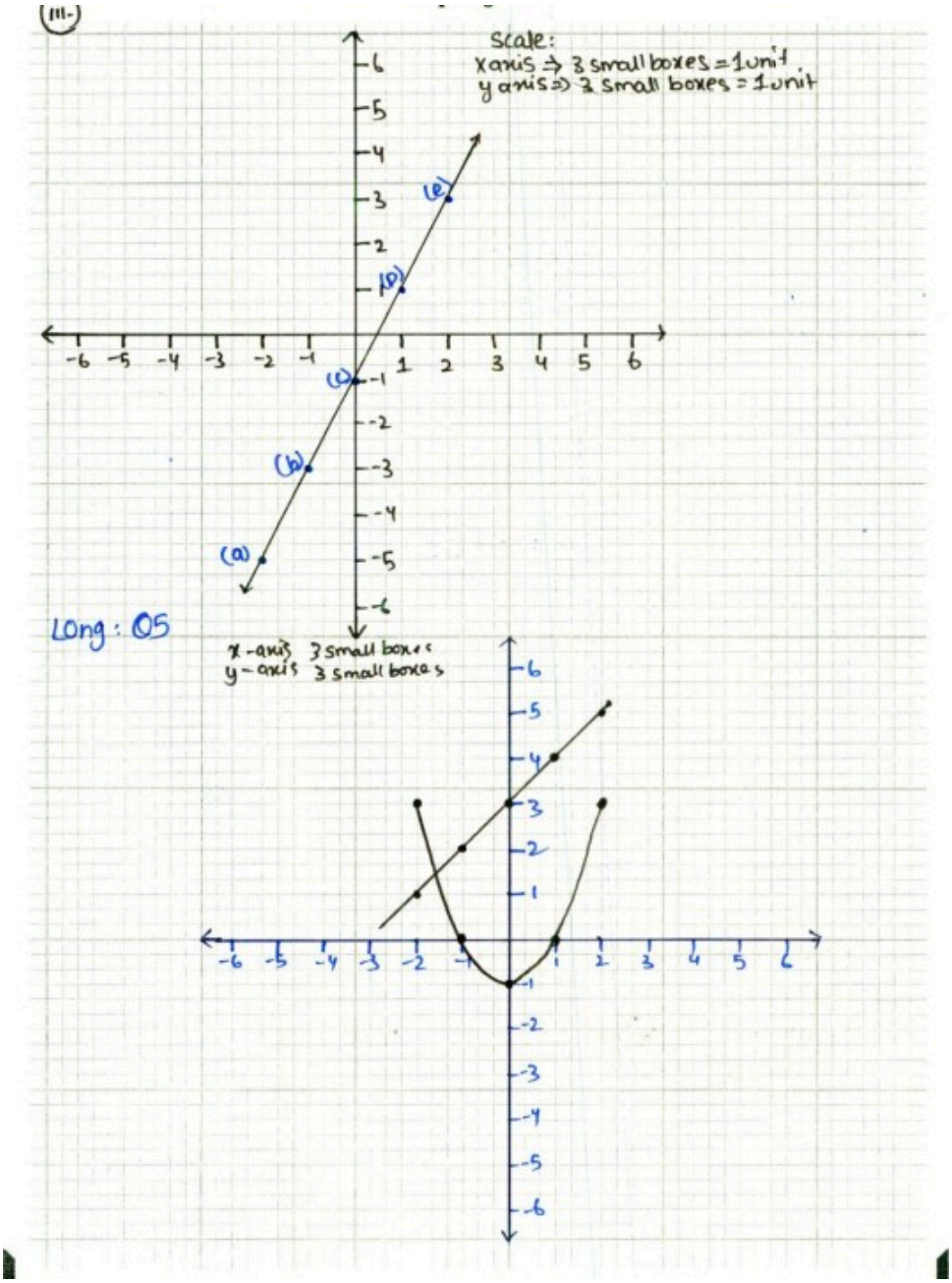
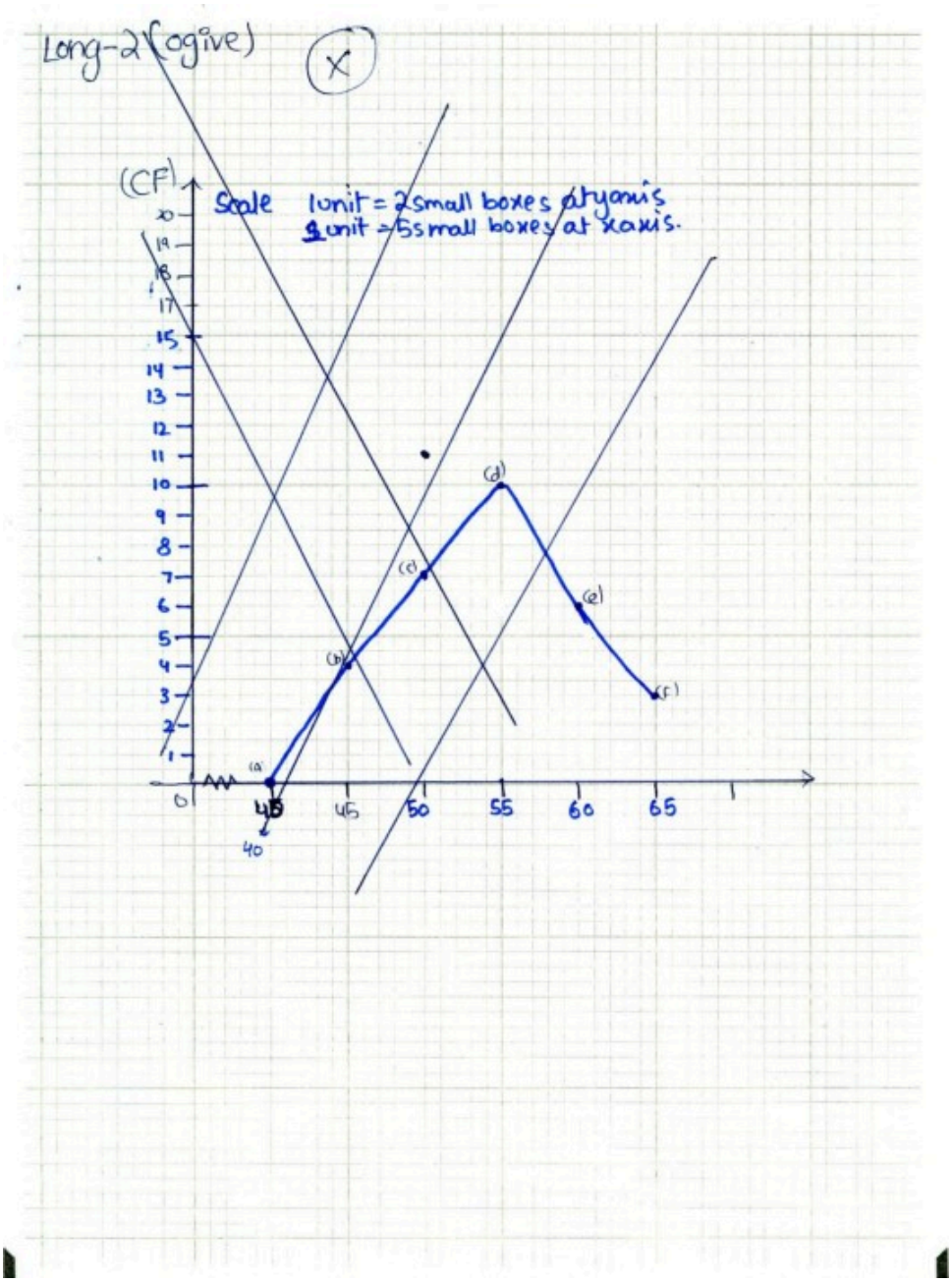

(iii-)
Scale:
x axis ⇒ 3 small boxes = 1 unit
y axis ⇒ 3 small boxes = 1 unit
(a)
(b)
(c)
(d)
(e)
Long: 05
x-axis 3 small boxes
y-axis 3 small boxes


Long-2 (ogive)
X
(CF)
Scale 1 unit = 2 small boxes at y axis
1 unit = 5 small boxes at x axis.
20
19
18
17
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
40
45
50
55
60
65
(a)
(b)
(c)
(d)
(e)
(f)

$\alpha = 3+2i+3-2i$

$= 6$

$-\frac{b}{a} \quad \frac{5}{1} \quad 5$

$\begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix} \times \begin{bmatrix} 3 & 1 \\ 2 & 4 \end{bmatrix}$

$1\times3+0\times2 \quad 1\times1+0\times4$

$2\times3+1\times2 \quad 1\times1+1\times4$

$3+0 \quad 1+0$

$6+2 \quad 1+4$

$3 \quad 1$

$8 \quad 5$

$(fog)\,x$

$f(g(x))$

$f(x) = 2x+1.$

$f(gx) = 2(gx)+1$

$= 2(x-3)+1$

$= 2x-6+1$

$= 2x-5$

$-3 < x < 3$

b^2-4ac

$25 \mp 4(1)(6)$

25 ∓ 24

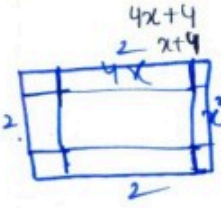
1

$\frac{(x-3)(x-2)}{(x+2)(x-2)} \times \frac{x+1}{(x-2)(x}$

$\frac{(x-3)}{(x-2)(x+3}$

$\frac{x^2-9}{x-3}$

$\frac{(x+3)(x-3)}{x-3}$



$\frac{2}{x-1} + \frac{3}{x+1} = 1$

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

$\frac{2x+2+3x-3}{x^2-1^2} = 1$

$5x-1 = x^2-1$

$= x^2-x+1-5x$

$0 = x^2-5x$

$0 = x(x-5)$

$a = i+j \quad b = i-j \quad \frac{0}{x} = x-5$

$0 = x-5$

$\boxed{5 = x}$

$(2+i)x + (1-i)y = 3$

$(1-i)(1+i)x - (1+i)iy = 2$

$(2+i)x+(1-i)$

$\frac{1-i}{i} \times (1+i)x - \frac{1+}{i}$

$(4x)$

Q. No. 2 Part (i)

$(3+4i) \div (5-2i)$ OR Word problem

$= \frac{3+4i}{5-2i}$

By multiplying and dividing

$= (5+2i)$

$= \frac{3+4i}{5-2i} \times \frac{5+2i}{5+2i}$

$= \frac{3(5+2i)+4i(5+2i)}{(5)^2-(2i)^2}$

$= \frac{15+6i+20i+8i^2}{25-4i^2} \quad \therefore i^2=-1$

$= \frac{15+26i+8(-1)}{25-4(-1)}$

$= \frac{15+-8+26i}{25+4}$

$= \frac{7+26i}{29}$

$= \frac{7}{29} + \frac{26i}{29}$

let:

$x+1$, x

$(x+1)(x) = 132$

$x^2+x-132=0$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{-1 \pm \sqrt{1+528}}{2}$

$x = \frac{-1 \pm \sqrt{529}}{2}$

$x = \frac{-1 \pm 23}{2}$

$x = \frac{-1+23}{2}$, $x = \frac{-1-23}{2}$

$x = \frac{22}{2}$, $x = \frac{-24}{2}$

$x = 11$ $x = -12$ omitted

Result

first positive no = 11

2nd positive no = 11+1 = 12

Q. No. 2 Part (ii)

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

$$A^{-1} = \frac{\text{Adj of } A}{|A|}$$

$$\text{Adj } A = \begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$$

$$|A| = [(1\times4)-(3\times2)]$$

$$= [4-6]$$

$$|A| = -2$$

$$A^{-1} = \frac{\begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}}{-2}$$

$$= \begin{bmatrix} \frac{4}{-2} & \frac{-2}{-2} \\ \frac{+3}{-2} & \frac{1}{-2} \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} -2 & 1 \\ 3/2 & -1/2 \end{bmatrix}$$

OR

$f(g(x)) = ?$

$f(x) = 2x+1$

Put $g(x)$ in x place

$f(g(x)) = 2(g(x)) + 1$

$= 2(x-3)+1$

$= 2x-6+1$

$\boxed{f(g(x)) = 2x-5}$

$g(f(x)) = ?$

$g(x) = x-3$

put $f(x)$ in x place

$g(f(x)) = f(x) - 3$

$= 2x+1-3$

$\boxed{g(f(x)) = 2x-2}$

Q. No. 2 Part (iii) Word problem

Ali completes task = 6 hrs

Ahmed completes = 12 hrs

Time taken together to complete a task = ?

Ali work rate = $\frac{1}{6}$, Ahmed " = $\frac{1}{12}$

if they work together.

Together w.r. = $\frac{1}{6} + \frac{1}{12}$

Work rate = $\frac{1}{4}$

To find time.

Work rate = $\frac{1}{4}$

take reciprocal

Time taken = 4 hrs

OR

Linear function graph

$y = 2x - 1$ . . . $\therefore x = -2, -1, 0, 1, 2$ . . . . .

$x = -2$

$y = 2(-2) - 1$

$= -4 - 1 = -5$

$x = -1$

$y = 2(-1) - 1$

$= -3$

$x = 0$

$y = 2(0) - 1$

$y = 0 - 1 = -1$

$x = 1$

$y = 2(1) - 1$

$y = 2 - 1$

$y = 1$

$x = 2$

$y = 2(2) - 1$

$y = 4 - 1$

$y = 3$

x	-2	-1	0	1	2
y	-5	-3	-1	1	3

Graph is plotted at the end graph pages.

Q. No. 2 Part (iv) $\left|\frac{2x-4}{6}\right| = \frac{4}{3}$

$\left(\frac{2x-4}{6}\right) = \frac{4}{3}$, $\left(\frac{2x-4}{6}\right) = \frac{-4}{3}$

$\frac{2x-4}{6} = \frac{4}{3}$, $\frac{2x-4}{6} = \frac{-4}{3}$

$3(2x-4) = 4 \times 6$, $(2x-4)3 = -4 \times 6$

$6x - 12 = 24$, $6x - 12 = -24$

$6x = 24 + 12$, $6x - 12 = -24$

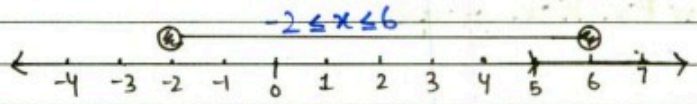
$6x = 36$, $6x = -24 + 12$

$\frac{6x}{6} = \frac{36^{6}}{6_{1}}$, $6x = -12$

, $6x = \frac{-12^{2}}{6_{1}}$

$\boxed{x = 6}$, $\boxed{x = -2}$

$-2 \leq x \leq 6$



$S.S = \{x / x \ -2 \leq x \leq 6\}$

Q. No. 2 Part (v)

P(-1,4) translated $v=[3,-2]$ to Q

$Q = (x_1+x_2, y_1+y_2)$

$= (-1+3, 4-2)$

$Q = (2, 2)$

R(5,7) translated $v=(3,-2)$ to S

$S = B(x_1+x_2, y_1+y_2)$

$= (5+3, 7-2)$

$S = (8, 5)$

$S(8,5) = S(8,5)$

Hence proved.

Q. No. 2 Part (vi) $\frac{2}{x-1} + \frac{3}{x+1} = 1 \quad x \in R$

Take LCM

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

$\therefore (a+b)(a-b) = a^2 - b^2$

$$\frac{2x+2+3x-3}{x^2-1} = 1$$

$$\frac{5x-1}{x^2-1} = 1$$

$$5x - 1 = x^2 - 1$$

$$5x - 1 = x^2 - 1$$

$$0 = x^2 + 1 - 1 - 5x$$

$$0 = x^2 - 5x$$

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

$$\frac{0}{x} = x - 5$$

$$0 = x - 5$$

$$\boxed{5 = x}$$

Solution set = $\{x = 5\}$

check:

$$\frac{2}{5-1} + \frac{3}{5+1} = 1$$

$$\frac{2}{4} + \frac{3}{6} = 1$$

$1 = 1$

proved

Q. No. 2 Part (vii) Chord problem

radius = 13 cm

length of chord from centre 10 cm

length of chord = ?

$$\text{length of chord} = 2\sqrt{r^2 - d^2}$$

$$= 2\sqrt{(13)^2 - (10)^2}$$

$$= 2\sqrt{169 - 100}$$

$$= 2\sqrt{69}$$

so length of chord is $2\sqrt{69} \approx 16.6$

Q. No. 2 Part (viii) Simplify

$$\frac{x^2-5x+6}{x^2-4} \times \frac{x+2}{x^2+x-6}$$

putting value from eq i

$$\frac{(x-3)(x-2)}{(x+2)(x-2)} \times \frac{x+2}{x^2+x-6}$$

putting value from eq (ii)

$$\frac{(x-3)(x-2)}{(x+2)(x-2)} \times \frac{x+2}{(x-2)(x+3)}$$

$$= \frac{(x-3)}{(x-2)(x+3)}$$

So

$$\frac{x^2-5x+6}{x^2-4} \times \frac{x+2}{x^2+x-6} = \frac{x-3}{(x-2)(x+3)}$$

Mid term break

1

x^2-5x+6

$x^2-(2+3)x+6$

$x^2-2x-3x+6$

$x(x-2)-3(x-2)$

$= (x-3)(x-2) \rightarrow$ eq (i)

Mid term break

x^2+x-6

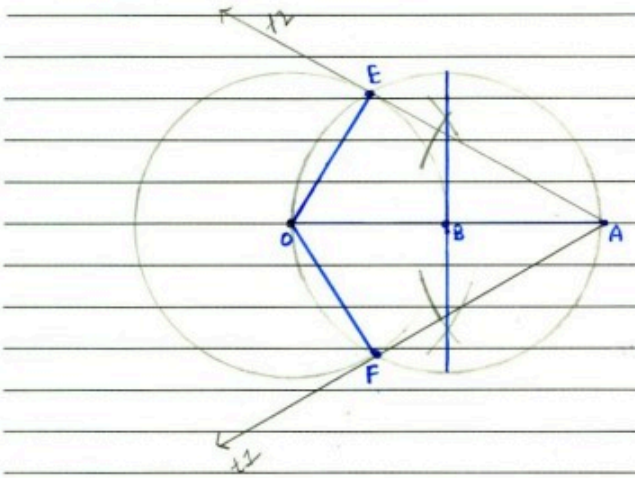
$x^2+(3-2)x-6$

$x^2+3x-2x-6$

$x(x+3)-2(x+3)$

$= (x-2)(x+3) \rightarrow$ eq (ii)

Q. No. 2 Part (ix)



Steps of construction

→ Draw a circle of radius 3 cm
→ Draw a line segment from centre of 6cm and name it A
→ Draw a bisector b/w OA which cuts OA at point B
→ Now draw an arc of OB
→ point where both circle intersects nam then E and F
→ join A to F and A to E these are required tangents.

Q. No. 3 (Page 1)

$(2+i)x + (1-i)y = 3 \rightarrow$ eq (i)

$(1+i)x - iy = 2 \rightarrow$ eq (ii)

multiply $\frac{(1-i)}{i}$ with eq (ii)

$$(1+i)x \times \frac{1-i}{i} - \frac{1-i}{i} \times iy = 2 \times \frac{1-i}{i}$$

$$(1+i)x \times \frac{1-i}{i} - (1-i)y = \frac{2-2i}{i}$$

$$x\left(\frac{1-i}{i} + \frac{1-i^2}{i}\right) - (1-i)y = \frac{2-2i}{i} \times \frac{i}{i}$$

$$x\left(\frac{1-i+i(1-i)}{i}\right) - (1-i)y = \frac{2i+2}{i^2}$$

$$x\left(\frac{1-1+1-i^2}{i}\right) - (1-i)y = -(2i+2)$$

$$x\left(\frac{2}{i}\right) - (1-i)y = -2i-2 \rightarrow \text{(iii)}$$

Now add eq (i) and (iii)

$$(2+i)x + (1-i)y = 3$$

$$+ \quad \frac{(2/i)x - (1-i)y = -2i-2}{(2+i)x + \left(\frac{2}{i}\right)x = 3+(-2i-2)}$$

$$2x + ix + \frac{2}{i}x = 3-2i-2$$

$$x\left(\frac{2}{1} + \frac{i}{1} + \frac{2}{i}\right) = 1-2i$$

$$x\left(\frac{2i+i^2+2}{i}\right) = 1-2i$$

$$x\left(\frac{2i+1}{i}\right) = 1-2i$$

$$x(2i+1) = i(1-2i)$$

$$x(2i+1) = i-2i^2$$

$$x(2i+1) = i+2$$

$$x = \frac{i+2}{2i+1} \times \frac{2i-1}{2i-1}$$

$$= \frac{2i^2-i+4i-2}{(2i)^2-(1)^2}$$

$$x = \frac{-2+3i-2}{-4-1}$$

$$x = \frac{-4+3i}{-5}$$

Q. No. 3 (Page 2)

$x = \frac{-(4-3i)}{-5}$ $\quad x = \frac{4}{5} - \frac{3}{5}i$

$x = \frac{4-3i}{5}$

put value of x in eq (ii)

$(1+i)\left(\frac{4-3i}{5}\right) - iy = 2$

$\frac{4-3i+4i-3i^2}{5} - 2 = iy$

$\frac{7+i}{5} - \frac{2}{1} = iy$

$\frac{7+i-10}{5} = iy$

$\frac{-3+i}{5} = iy$

$\frac{-3+i}{5} \div i = y$

$\frac{-3+i}{5} \times \frac{1}{i} = y$

$\frac{-3+i}{5i} \times \frac{5i}{5i} = y$

$\frac{5i(-3+i)}{25i^2} = y$

$\frac{-15i+5i^2}{-25} = y$

$\frac{-(15i-5)}{-25} = y$

$\frac{3}{5}\frac{15}{25}i - \frac{5}{25}\frac{1}{5} = y$

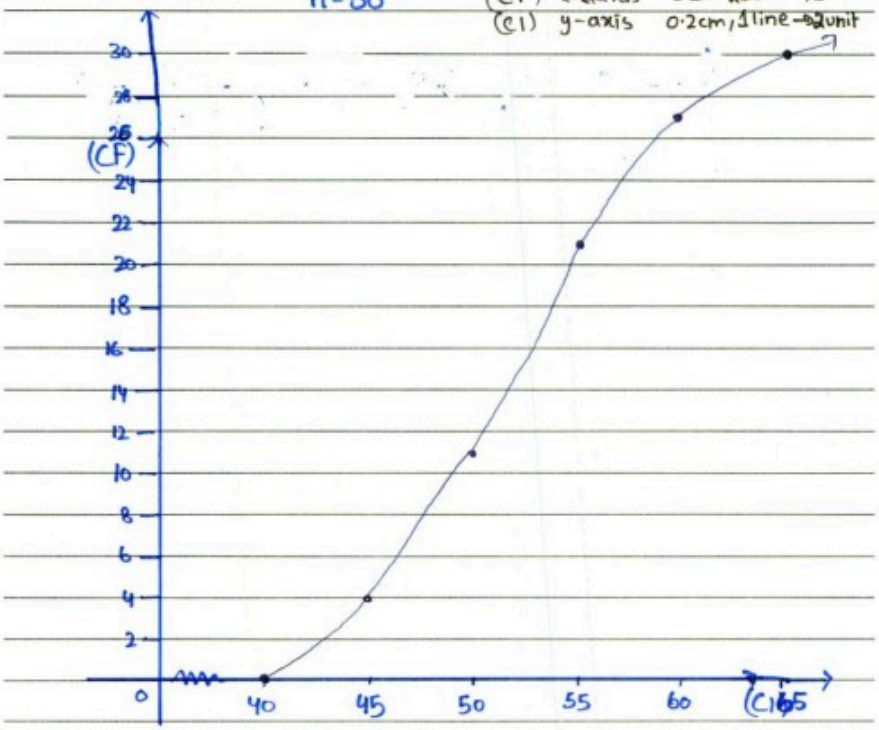
$y = -\frac{1}{5} + \frac{3}{5}i$

Q. No. 4 (Page 1)

class interval	frequency	commulative frequency
40-45	4	4
45-50	7	11
50-55	10	21
55-60	6	27
60-65	3	30

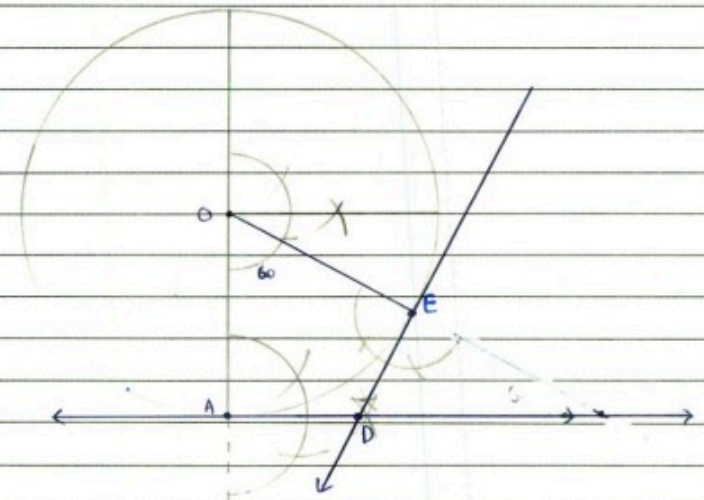
n=30

(CF) x-axis 0·2cm → 1unit
(CI) y-axis 0·2cm, 1line → 2unit



Q. No. 4 (Page 2) $y = x^2 - 1$

Q. No. 5 (Page 1) Circle



Steps of construction:

→ Draw a circle of radius 4cm.
→ make a vertical straight diameter line and the point where it meet to circumference is A
→ Draw 90° angle on A and make a tangent
→ Now draw 60° angle from centre O and B till point E
→ Now draw a 90° tangent at point E which cuts the previous tangent

Q. No. 5 (Page 2) OR

$y = x^2 - 1$

$y = -x + 3$

$y = x^2 - 1$

$x = (-2, -1, 0, 1, 2)$

$y = (-2)^2 - 1$	$y = (-1)^2 - 1$	$y = (0)^2 - 1$	$y = (1)^2 - 1$
$y = 4 - 1$	$= 1 - 1$	$= 0 - 1$	$= 1 - 1$
$y = 3$	$= 0$	$= -1$	$= 0$
$(-2, 3)$	$(-1, 0)$	$(0, -1)$.	$(1, 0)$

$y = (2)^2 - 1$
$= 4 - 1$
$y = 3$
$(2, 3)$

$y = -x + 3$

$y = -2 + 3$	$y = -1 + 3$	$y = 0 + 3$
$y = 1$	$= 2$	$y = 3$
$(-2, 1)$	$(-1, 2)$	$(0, 3)$
$y = 1 + 3$	$y = 2 + 3$	
$= 4$	$= 5$	
$(1, 4)$	$(2, 5)$	

Solution is done on graph at the end.

point of intersection $(1.6, 1.2) = (x, y)$

→ $y = x^2 - 1$
x-intercept = $\sqrt{1}$
y-intercept = -1

→ $y = -x + 3$
x-intercept = 3
y-intercept = 3