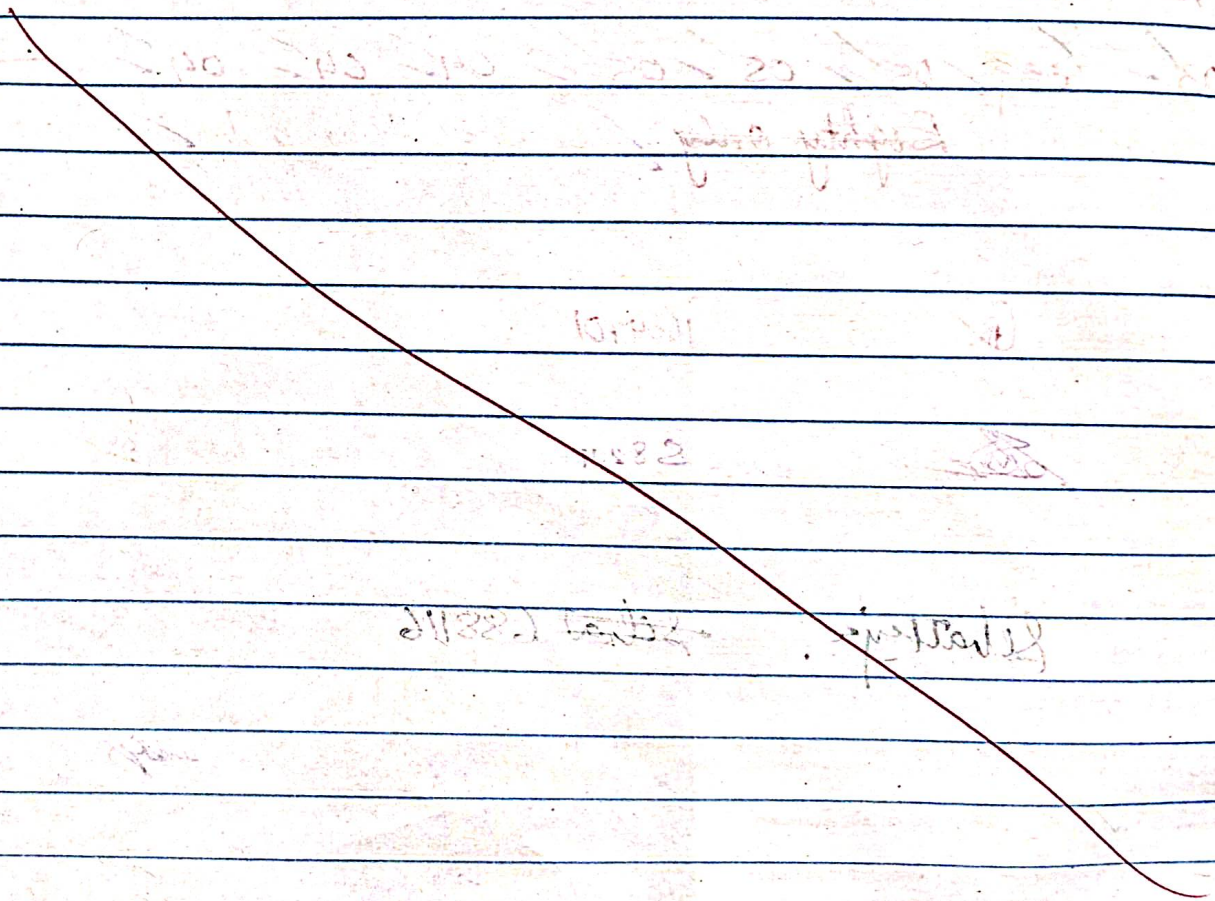
Mathematics Standard 041

Space for writing
Question Number





SECTION-A

(A) 3a.

(D) neither prime nor composite.

(C) $\frac{3}{\sqrt{10}}$

(B) 5

(B) $\frac{4}{\sqrt{3}}$

(A) 960

(C) 60 m

(C) Two

(A) 30°

(B) $\frac{2}{3}$

(B) 50°

(D) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

(B) $\frac{182\pi}{3}$ cm^3

Rough

$\frac{2}{3}\pi(6\times6\times6 - 5\times5\times5)$

$\frac{336}{6}$ $\frac{216}{125}$ $\frac{182\pi}{3}$

$\frac{216}{91}$

$\frac{434}{3}$ $\frac{130.2}{86.0}$

$\frac{1302}{44.2}$

$2\times(4\times4) + (4\times8) + (4\times8)$

$16 + 32 + 32$

$= 16 + 64 = 80$

$\alpha + \beta = 5$

$-\frac{q}{p}$ $\frac{r}{p}$

$\alpha\beta(\alpha^2+\beta^2)$

$\alpha\beta((\alpha+\beta)^2 - 2\alpha\beta)$

$= \frac{r}{p}\left(\frac{q^2}{p^2} - \frac{2r}{p}\right)$

$\frac{r}{p}\left(\frac{q^2-2rp}{p^2}\right)$

$\frac{r(q^2-2rp)}{p^3}$

$\frac{30}{360}\times\frac{22}{7}\times\frac{42}{6}\times\frac{42}{7}$ $\frac{440}{462}$

$\frac{330}{360}\times\frac{22}{7}\times\frac{42}{7}\times\frac{42}{6}$ $\frac{462}{4620}$

$35 + \frac{33-21}{66-11-21}\times5$ $\frac{5082}{30}$

$= 35 + \frac{12}{34}\times5$ $\frac{17}{17}$

Rough

$\cot\theta = \frac{b}{p} = 3$

$b=3$ $p=1$

$\sqrt{3^2+1} = \sqrt{10}$

$\cos\theta = \frac{b}{h} = \frac{3}{\sqrt{10}}$

$\sin A = \frac{1}{2}$

$A = 30°$

$\tan 30° + \cot 30°$

$= \frac{1}{\sqrt{3}} + \sqrt{3}$

$= \frac{1+3}{\sqrt{3}} = \frac{4}{\sqrt{3}}$

$\frac{2}{p} = \frac{3p}{p}$

$p = \frac{2}{3}$

6cm, 5cm

$\frac{2}{3}\pi\times6\times6\times6 - \frac{2}{3}\pi\times5\times5\times5$

$\frac{336}{6}$ $\frac{216}{125}$

$\frac{216}{91}$

$\frac{2}{3}\pi\times91 = \frac{182\pi}{3}$

πr^2 $\frac{\pi r^2}{2}$

$= \pi\left(\frac{d}{2}\right)^2\times\frac{1}{2}$

$= \pi\frac{d^2}{4}\times\frac{1}{2}$

$= \frac{\pi d^2}{8}$

$\frac{66}{32}$

$\frac{34}{}$

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14. (D) $1^2, 3^2, 5^2, 7^2, \ldots$

15. (C) $\frac{\pi d^2}{8}$

16. (C) 12cm.

17. (C) 44.2

18. (A) $\frac{15}{25}$

19. (C) Assertion is true but Reason is false.

20. (D) Assertion is false but Reason is true.

Rough

3 median − 2 mean
$= 3 \times 43.4 - 2 \times 43$
$130.2 - 86$
$\begin{array}{r} 43.4 \\ \times\ 3 \\ \hline 130.2 \end{array}$
$\begin{array}{r} 130.2 \\ -\ 86.0 \\ \hline 44.2 \end{array}$

1, 6, 8, 9, 10, 12, 14, 15, 16, 20, 21, 22, 24, 25

$\frac{15}{25} =$

$\frac{n}{2}(1+n)$ $\frac{n(n+1)}{2}$

SECTION-B

21. Given: Distance between (4, p) and (1, 0) is 5

To Find: Value of p.

Solution:

We know distance formula, $\sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$

Applying this formula with $x_2 = 4$, $x_1 = 1$, $y_2 = p$ and $y_1 = 0$,

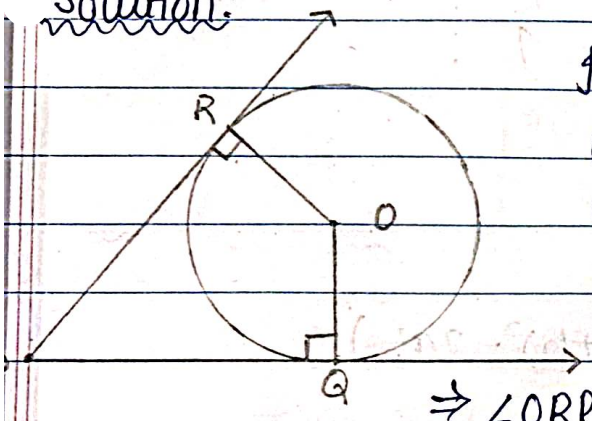
$\sqrt{(4-1)^2 + (p-0)^2} = 5$

Squaring both sides,

$(3)^2 + (p)^2 = 25 \Rightarrow (p)^2 = 25 - 9 = 16 \Rightarrow p = \sqrt{16} \Rightarrow p = \pm 4$

$\therefore p = \pm 4$

Given: O is centre of circle and PQ and PR are tangents.
To Show: Quadrilateral PQOR is cyclic.
Solution:



In quadrilateral PQOR,
OR ⊥ PR and OQ ⊥ PQ {∵ Radius of circle is perpendicular to tangent at that point. OR and OQ are radius ⊥ tangent PR and PQ respectively.}

$\Rightarrow \angle ORP = 90^\circ$ and $\angle OQP = 90^\circ$

$\Rightarrow$ Opposite angles, $\angle ORP + \angle OQP = 90^\circ + 90^\circ = 180^\circ$ — (i)

Adding all angles of PQOR,

$\angle RPQ + \angle ROQ + \angle ORP + \angle OQP = 360^\circ$ {∵ Sum of angles (int.) of quadrilateral is 360°}

$\Rightarrow \angle RPQ + \angle ROQ + 90^\circ + 90^\circ = 360^\circ$

$\Rightarrow \angle RPQ + \angle ROQ = 360^\circ - 180^\circ = 180^\circ$

$\Rightarrow$ Sum of opposite angles, $\angle RPQ$ and $\angle ROQ$ is 180° — (ii)

As in PQOR, sum of opposite angles is 180°, i.e., they are supplementary, from (i) and (ii), PQOR is cyclic quadrilateral.

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23. Given: α and β are zeros of $px^2 + qx + r$

To Find: Value of $\alpha^3\beta + \beta^3\alpha$

Solution:

$f(x) = px^2 + qx + r. \rightarrow a = p, b = q, c = r$

Sum of zeros, $\alpha + \beta = \frac{-b}{a} = \frac{-q}{p}$ — (i)

Product of zeros, $\alpha\beta = \frac{c}{a} = \frac{r}{p}$ — (ii)

$\alpha^3\beta + \beta^3\alpha = \alpha\beta(\alpha^2 + \beta^2)$

$= \alpha\beta[(\alpha+\beta)^2 - 2\alpha\beta]$ $(\because a^2+b^2 = (a+b)^2 - 2ab)$

Substituting values from (i) and (ii),

$= \frac{r}{p}\left[\left(\frac{-q}{p}\right)^2 - 2 \times \frac{r}{p}\right] = \frac{r}{p}\left[\frac{q^2}{p^2} - \frac{2r}{p}\right]$

$= \frac{r}{p} \times \frac{(q^2 - 2rp)}{p^2} = \frac{r(q^2 - 2rp)}{p^3} = \frac{q^2r - 2r^2p}{p^3}$

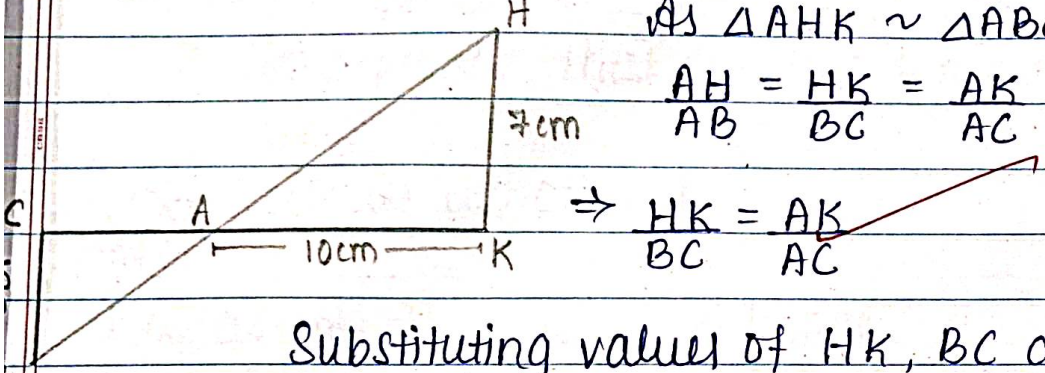
$\therefore$ Value of $\alpha^3\beta + \beta^3\alpha$ is $\frac{q^2r - 2r^2p}{p^3}$ or $\frac{r(q^2-2rp)}{p^3}$.

(a) Given: $\triangle AHK \sim \triangle ABC$

$AK = 10cm$ $BC = 3.5cm$ $HK = 7cm$.

To Find: Length of AC.

Solution:



As $\triangle AHK \sim \triangle ABC$,

$\frac{AH}{AB} = \frac{HK}{BC} = \frac{AK}{AC}$ [∵ Corresponding sides of similar triangles are proportional]

$\Rightarrow \frac{HK}{BC} = \frac{AK}{AC}$

Substituting values of HK, BC and AK,

$\frac{7cm}{3.5cm} = \frac{10cm}{AC} \Rightarrow \frac{2}{1} = \frac{10cm}{AC} \Rightarrow 2AC = 10cm \Rightarrow AC = 5cm$.

∴ $AC = 5cm$

(a) Given: $\tan A = \frac{4}{3}$

To Find: sinA and cosA.

Solution:

$\tan A = \frac{P}{b} = \frac{4}{3}$ } From this, let $P = 4x$ and $b = 3x$.

According to Pythagoras Theorem, $h = \sqrt{P^2 + b^2}$

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$\Rightarrow h = \sqrt{(4x)^2 + (3x)^2}$

$= \sqrt{16x^2 + 9x^2} = \sqrt{25x^2} = 5x$.

$\sin A = \frac{P}{h} = \frac{4x}{5x} = \frac{4}{5}$

$\cos A = \frac{b}{h} = \frac{3x}{5x} = \frac{3}{5}$.

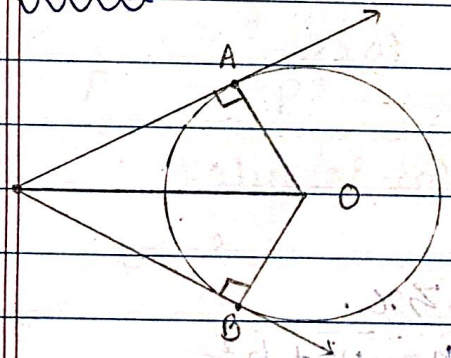
$\therefore \sin A = 4/5$

$\cos A = 3/5$

SECTION-C

26. (a) To Prove: Lengths of tangents drawn from external point to a circle are equal.

Proof:



Construct circle with centre O.

From external point P, construct tangents PA and PB to circle at A and B.

Join OA, OB and OP.

In $\triangle OPA$ and $\triangle OPB$,

$OP = OP$ (common)

$OA = OB$ (radius of circle)

$\angle OAP = \angle OBP = 90°$ ($\because$ radius is perpendicular to tangent. So, $OA \perp PA$ and $OB \perp PB$)

$\Rightarrow$ By RHS congruency criteria, $\triangle OPA \cong \triangle OPB$.

$\Rightarrow PA = PB$ (cpct)

$\therefore$ Hence proved that the two tangents from same point are equal.

To Prove: $\sqrt{5}$ is irrational.

Proof:

Let us assume that $\sqrt{5}$ is rational.

$\sqrt{5} = \frac{a}{b}$, where a and b are co-primes and $\frac{a}{b}$ is rational.

$\Rightarrow \sqrt{5}b = a$.

Squaring both sides,

$5b^2 = a^2$. —①

Here, 5 is a factor of a^2. This means 5 is a factor of a.

We can express a in terms of 5 and another variable c as:

$a = 5c$.

Substituting value of a in eq. ①,

$5b^2 = (5c)^2 = 25c^2$

$\Rightarrow b^2 = 5c^2$

Here, 5 is factor of b^2, so 5 is also factor of b.

This contradicts the statement that a and b are co-prime; as we get 5 as a common factor.

This contradiction arises because our assumption that $\sqrt{5}$ is rational is wrong.

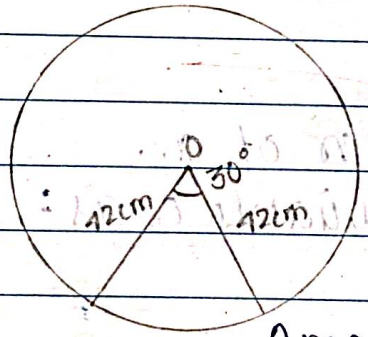
{$\therefore \sqrt{5}$ is irrational.}

28. Given: Circle radius = 42cm.

Central angle = 30°

To Find: Area of minor sector and corresponding major sector.

Solution:



Area of sector of circle = $\frac{\theta}{360°} \times \pi r^2$

$\Rightarrow$ Minor sector area:

$= \frac{30°}{360°} \times \frac{22}{7} \times 42 \times 42 = 462 cm^2$

Circle area = $\pi r^2 = \frac{22}{7} \times 42 \times 42 = 5544 cm^2$

Area of major sector = Circle area − Area of minor se

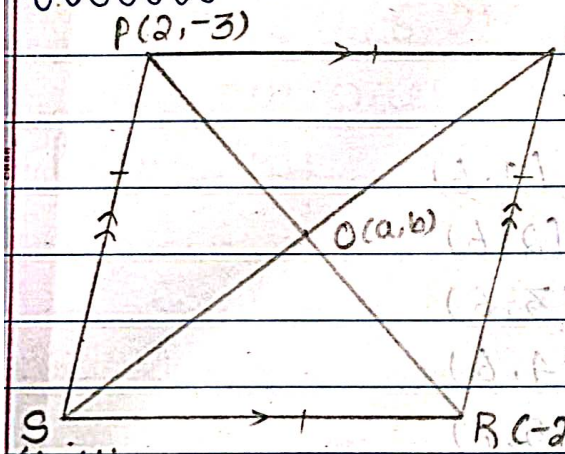
$= 5544\,cm^2 - 462\,cm^2 = 5082\,cm^2$

$\therefore$ minor sector area $= 462\,cm^2$
major sector area $= 5082\,cm^2$

42
22
84
840
924
1 2
924
6
5544
5544
462
5082

Given: Rhombus PQRS three vertices are P(2, -3) Q(6, 5) R(-2, 1)
To Find: Coordinates of fourth vertex S.
Point of intersection of diagonals PR and QS.

Solution:



We know, a rhombus is a parallelogram.
$\Rightarrow$ PQRS is a parallelogram.
In a llgm, midpoints of both diagonals is the same, i.e., diagonals bisect each other.
Let diagonals PR and QS bisect each other at O(a, b)

Midpoint of PR, where P(2, -3) and R(-2, 1):

$a = \frac{2 + (-2)}{2} = \frac{0}{2} = 0$, $b = \frac{-3 + 1}{2} = \frac{-2}{2} = -1$

[$\because$ Midpoint formula : $\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}$]

$\Rightarrow$ Coordinates of midpoint O are (0, -1).
These coordinates would be same for midpoint of diagonal QS.

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Midpoint of QS, where Q(6,5) and S(x,y):-

$\frac{6+x}{2} = a = 0 \Rightarrow 6+x=0 \Rightarrow x=-6.$

$\frac{5+y}{2} = b = -1 \Rightarrow 5+y=-2 \Rightarrow y=-7.$

Coordinates of S are (-6,-7).

$\therefore$ S(-6,-7)

Diagonals PR and QS intersect at (0,-1)

30. Given: Two dice are thrown together.

Sample Space: (1,1) (1,2) (1,3) (1,4) (1,5) (1,6)
(2,1) (2,2) (2,3) (2,4) (2,5) (2,6)
(3,1) (3,2) (3,3) (3,4) (3,5) (3,6)
(4,1) (4,2) (4,3) (4,4) (4,5) (4,6)
(5,1) (5,2) (5,3) (5,4) (5,5) (5,6)
(6,1) (6,2) (6,3) (6,4) (6,5) (6,6)

(i) Probability of even sum.

Favourable outcomes: (1,1)(1,3)(1,5)(2,2)(2,4)(2,6)(3,1)(3,3)
(3,5)(4,2)(4,4)(4,6)(5,1)(5,3)(5,5)(6,2)(6,4)(6,6) → 18 outcomes

Total outcomes = 36.

Probability of even sum = $\frac{\text{Fav. outcomes}}{\text{Total outcomes}} = \frac{18}{36} = \frac{1}{2}$

$\therefore P(\text{even sum}) = \frac{1}{2}$

(ii) Probability of even product.

Favourable outcomes : (1,2) (1,4) (1,6) (2,1) (2,2) (2,3) (2,4) (2,5) (2,6) (3,2) (3,4) (3,6) (4,1) (4,2) (4,3) (4,4) (4,5) (4,6) (5,2) (5,4) (5,6) (6,1) (6,2) (6,3) (6,4) (6,5) (6,6) → 27.

Total outcomes = 36.

Probability = $\frac{\text{Fav. outcomes}}{\text{Total outcomes}} = \frac{27}{36} = \frac{3}{4}$.

$\therefore P(\text{even product}) = \frac{3}{4}$

Given: $\frac{\sec\alpha}{\text{cosec}\beta} = p$ and $\frac{\tan\alpha}{\text{cosec}\beta} = q$.

To Prove: $(p^2 - q^2)\sec^2\alpha = p^2$.

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Proof :

$$p^2 = \left(\frac{\sec\alpha}{\operatorname{cosec}\beta}\right)^2 = \frac{\sec^2\alpha}{\operatorname{cosec}^2\beta}$$

$$q^2 = \left(\frac{\tan\alpha}{\operatorname{cosec}\beta}\right)^2 = \frac{\tan^2\alpha}{\operatorname{cosec}^2\beta}$$

LHS

$$(p^2 - q^2)\sec^2\alpha = \left(\frac{\sec^2\alpha}{\operatorname{cosec}^2\beta} - \frac{\tan^2\alpha}{\operatorname{cosec}^2\beta}\right)\sec^2\alpha$$

$$= \frac{(\sec^2\alpha - \tan^2\alpha)}{\operatorname{cosec}^2\beta} \times \sec^2\alpha \qquad \left[\because 1 + \tan^2\theta = \sec^2\theta \Rightarrow \sec^2\theta - \tan^2\theta = 1\right]$$

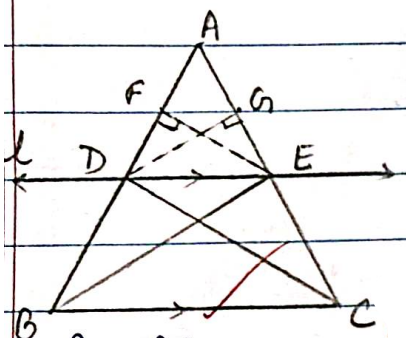
$$= \frac{1}{\operatorname{cosec}^2\beta} \times \sec^2\alpha = \frac{\sec^2\alpha}{\operatorname{cosec}^2\beta}$$

$$= \left(\frac{\sec\alpha}{\operatorname{cosec}\beta}\right)^2 = p^2 = \text{RHS}.$$

$\therefore$ Proved, $(p^2 - q^2)\sec^2\alpha = p^2$.

SECTION - D

32. (a) To Prove: Line drawn parallel to one side of a triangle to intersect other two sides in distinct points, then other two sides are divided in the same ratio.



Construction: Construct $\triangle ABC$. Line $l \parallel BC$, intersecting AB at D and AC at E.
Construct $EF \perp AD$ and $DG \perp AE$.
Join DC and BE.

Proof:

Area of $\triangle ADE$ (with height EF and base AD) $= \frac{1}{2} \times EF \times AD$ —— (I)

Area of $\triangle ADE$ (with height DG and base AE) $= \frac{1}{2} \times DG \times AE$ —— (II)

In $\triangle BDE$, base = BD and height = EF

$\Rightarrow$ Ar $\triangle BDE = \frac{1}{2} \times BD \times EF$ —— (III).

In $\triangle CDE$, base = CE and height = DG.

$\Rightarrow$ Ar $\triangle CDE = \frac{1}{2} \times CE \times DG$ —— (IV).

$$\frac{\text{Ar } \triangle ADE \text{ (eq I)}}{\text{Ar } \triangle BDE \text{ (eq III)}} = \frac{\frac{1}{2} \times EF \times AD}{\frac{1}{2} \times BD \times EF} = \frac{AD}{BD} \quad \text{—— (V)}$$

$$\frac{\text{Ar } \triangle ADE \text{ (eq II)}}{\text{Ar } \triangle CDE \text{ (eq IV)}} = \frac{\frac{1}{2} \times DG \times AE}{\frac{1}{2} \times CE \times DG} = \frac{AE}{CE} \quad \text{—— (VI)}$$

Now, $\triangle BDE$ and $\triangle CDE$ lie on same base DE and between same parallel lines. $\Rightarrow$ Ar $\triangle BDE$ = Ar $\triangle CDE$.

Considering this, in eq. (V) and (VI), $\frac{\text{Ar } \triangle ADE}{\text{Ar } \triangle BDE} = \frac{\text{Ar } \triangle ADE}{\text{Ar } \triangle CDE} \Rightarrow \frac{AD}{BD} = \frac{AE}{CE}$

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As $\frac{AD}{BD} = \frac{AE}{CE}$, DE divides AB and AC in same ratio.

∴ Proved.

33. Given: 100 policy holders data of age.

To find: Modal age and median age.

Table:

Age (in yrs)	No.	cf
15 - 20	2	2
20 - 25	4	6
25 - 30	18	24
30 - 35	21	45
35 - 40	33	78
40 - 45	11	89
45 - 50	3	92
50 - 55	6	98
55 - 60	2	100

Solution:

Modal class is 35 - 40

$l = 35 \quad h = 5 \quad f_1 = 33 \quad f_0 = 21$

$f_2 = 11$

$$\text{mode} = l + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$$

$$= 35 + \frac{33 - 21}{66 - 21 - 11} \times 5$$

$$= 35 + \frac{12}{34} \times 5 = 35 + \frac{30}{17}$$

$$= 35 + 1.76 = 36.76 \text{ yrs.}$$ (Approx)

Median:

$N/2 = 100/2 = 50$ ⇒ median class is 35 - 40

$l = 35 \quad h = 5 \quad N/2 = 50 \quad cf = 45 \quad f = 33$

$\text{median} = l + \frac{N/2 - cf}{f} \times h$

$= 35 + \frac{50 - 45}{33} \times 5 = 35 + \frac{25}{33} = 35 + 0.75 = 35.75 \text{ yrs (Approx)}$

∴ Modal age is 36.76 yrs.
Median age is 35.75 yrs.

(In graph paper) P.T.O →

(a) Given: Sum of math marks and science marks = 30
(2 + math mark) × (Science mark − 3) = 210

To Find: Marks secured in both subjects.

Solution:

Let math marks = x and science marks = y.

ATQ, $x + y = 30 \Rightarrow x = 30 - y \quad \ldots (1)$

If 2 marks more in math, math mark new = $(x+2)$

If 3 marks less in science, science mark new = $(y-3)$

Product of new marks = 210 $\Rightarrow (x+2)(y-3) = 210$.

0.75
33 | 250
231
190
165

233
8
264

233
7
231

1336
198

33
5
165

75
33
225
250
225
25

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Substituting value of x from (1),

$(30-y+2)(y-3)=210$

$\Rightarrow (32-y)(y-3)=210$

$\Rightarrow 32y-96-y^2+3y=210$

$\Rightarrow 35y-96-y^2=210$

$\Rightarrow y^2-35y+306=0$

$\Rightarrow y^2-18y-17y+306=0$

$\Rightarrow y(y-18)-17(y-18)=0$

$\Rightarrow (y-17)(y-18)=0$.

$\Rightarrow y=17$ or 18.

When $y=17$, $x=30-17=13$.

When $y=18$, $x=30-18=12$.

∴ Her marks in math is 13 or 12 and in science is 17 or 18 respectively.

Section E after graph papers

→ PTO

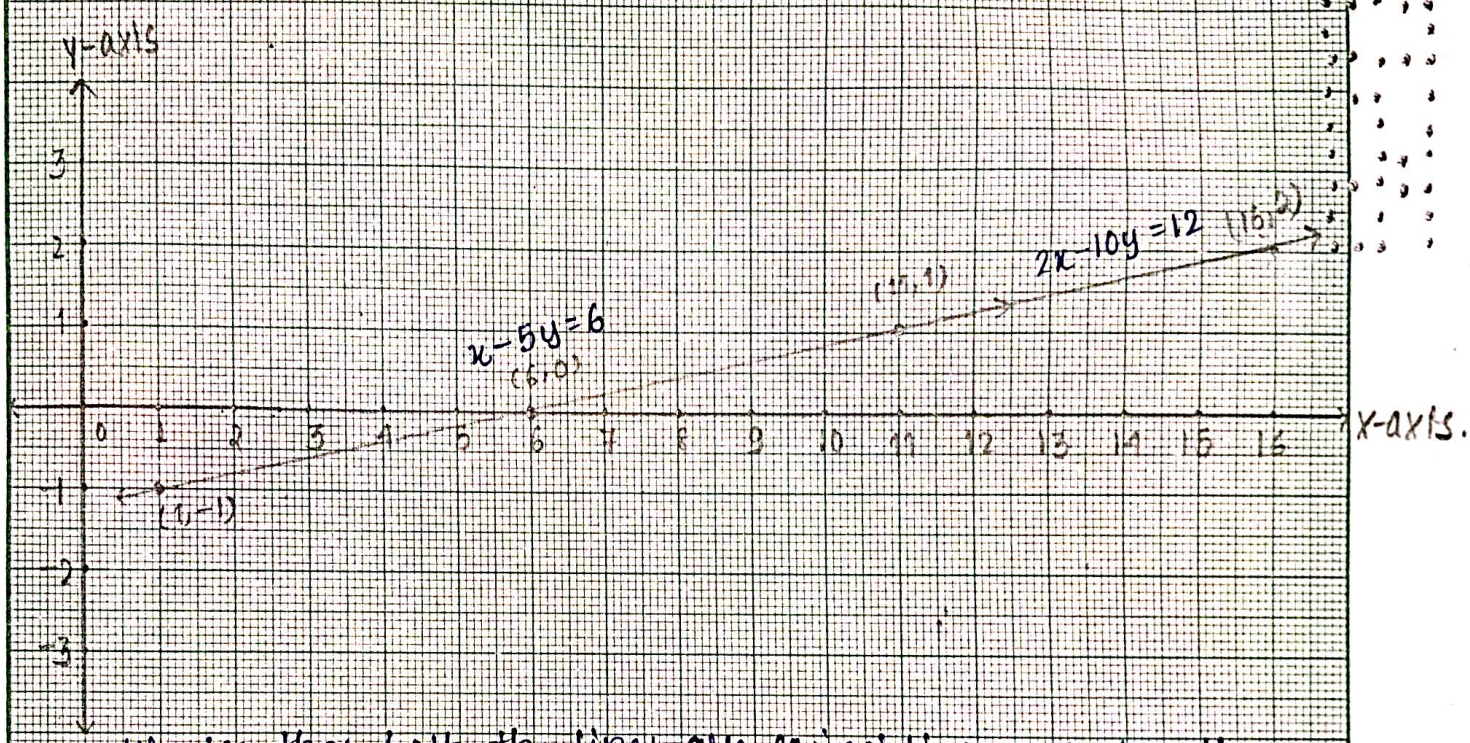
To Do: Represent graphically and comment on consistency.

Solution:

Values of x and y for $x-5y=6$: $x \to 6, 11, 1$ } solutions
$y \to 0, 1, -1$ }

Values of x and y for $2x-10y=12$: $x \to 11, 16, 1$ } solutions
$y \to 1, 2, (-1)$ }

Representation:-

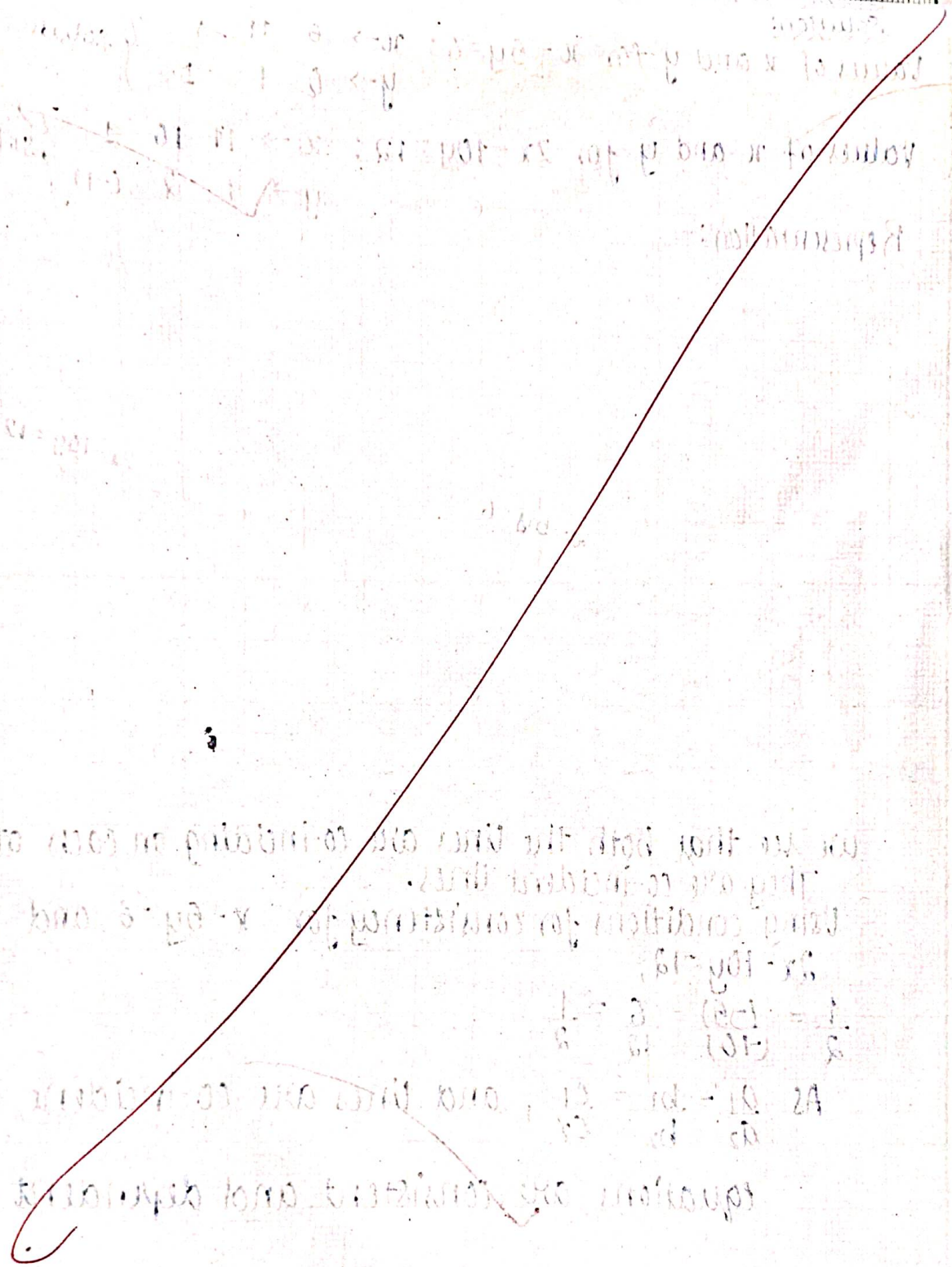


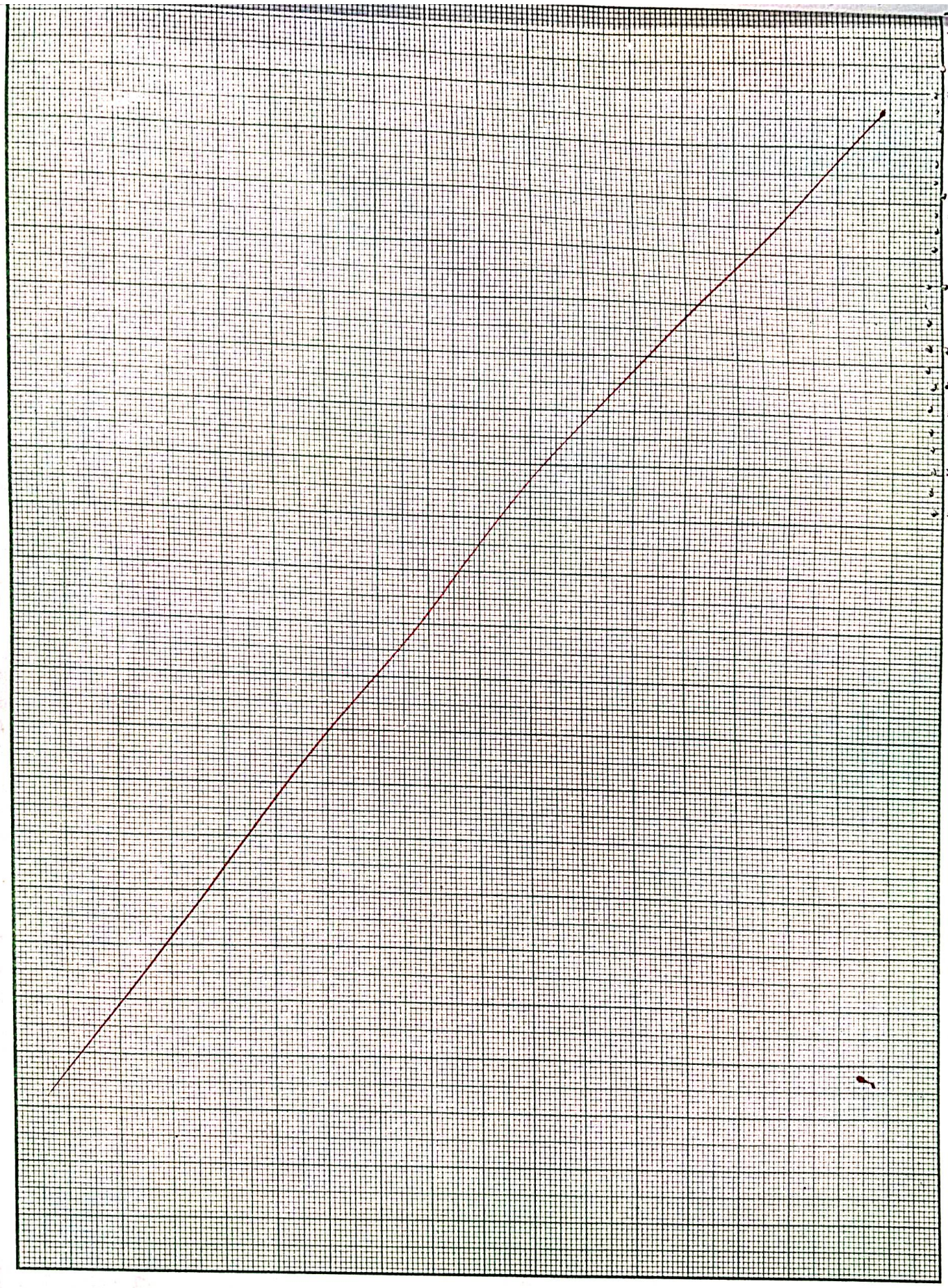
We see that both the lines are co-inciding on each other. They are co-incident lines.

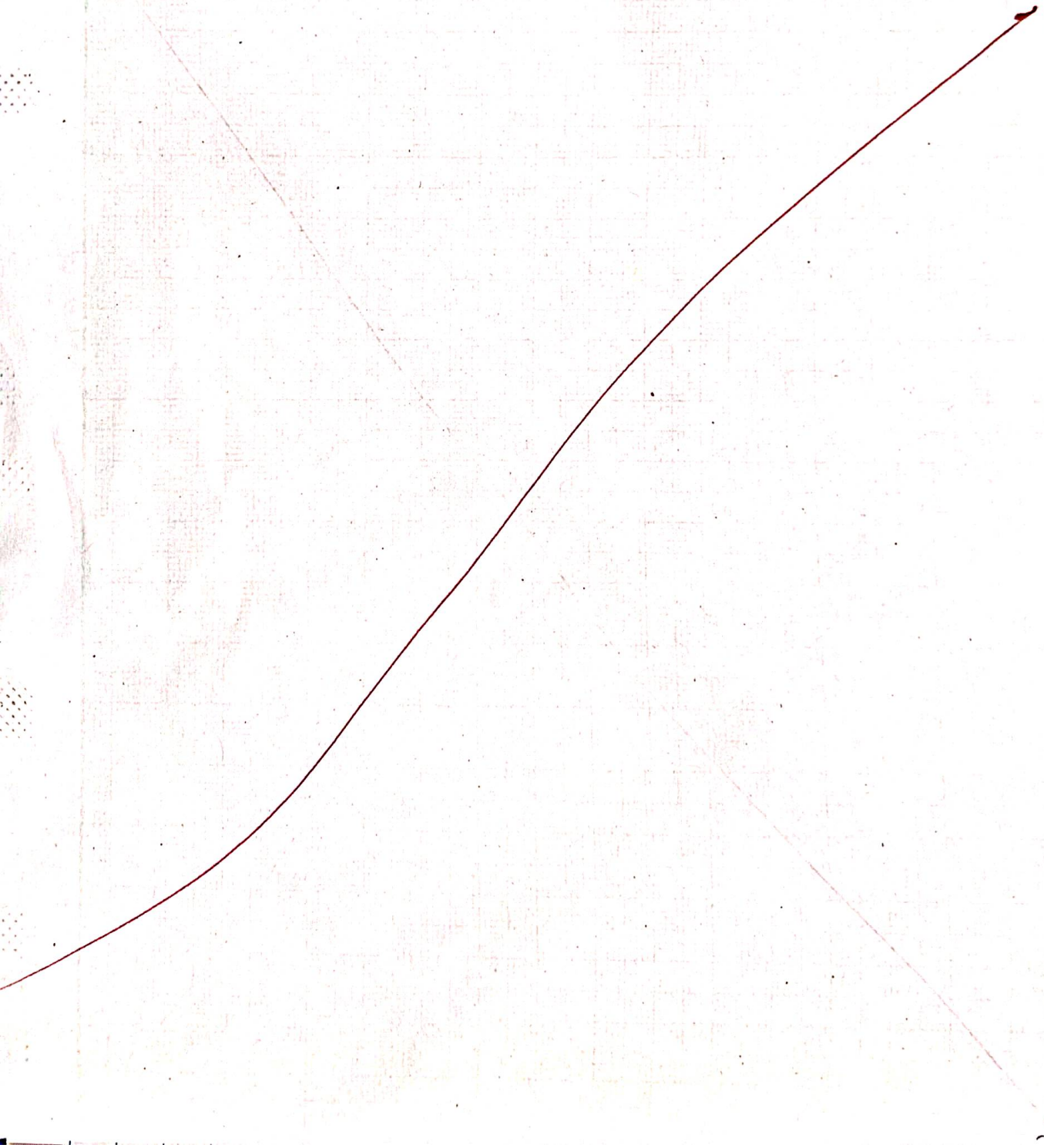
Using conditions for consistency for $x-5y=6$ and $2x-10y=12$,

$$\frac{1}{2} = \frac{(-5)}{(-10)} = \frac{6}{12} = \frac{1}{2}$$

As $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$, and lines are co-incident, the equations are consistent and dependent.







SECTION-E

(i) Given: Edge of cube = 6cm.
To Find: diagonal length.
Solution:
Diagonal of cube = $\sqrt{a^2+a^2+a^2} = \sqrt{3a^2} = a\sqrt{3}$
$\Rightarrow$ Diagonal = $\sqrt{6^2+6^2+6^2} = \sqrt{3\times6^2} = 6\sqrt{3}$ cm.
$\therefore$ Ans = $6\sqrt{3}$ cm

(ii) Given: Length of edge of cube = 7cm.
To Find: Volume.
Solution:
Volume of cube = $a \times a \times a = a^3$
$\Rightarrow$ Volume = $7cm \times 7cm \times 7cm = 343cm^3$.
$\therefore$ Ans = $343cm^3$

(iii) @
Given: Hemisphere radius = 7cm.
To Find: Curved surface area.
Solution:
CSA of hemisphere = $2\pi r^2 = (2\times\frac{22}{7}\times7\times7)\,cm^2 = 308cm^2$

6
49
7
343

2
49
7
308

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∴ Hemisphere CSA = 308 cm²

37. Given: Total loan : ₹118000.
First instalment : ₹1000
Increase in instalment : ₹100 / month.

(i) To Find: Amount paid in 30th instalment.

Solution:

The situation forms an A.P of money paid per month:

₹1000, ₹1100, ₹1200 ...

$a = ₹1000 \quad d = ₹100.$

For 30th instalment, $n = 30$

$a_n = a + (n-1)d$

$\Rightarrow a_{30} = ₹1000 + (30-1) \times ₹100$

$= ₹1000 + ₹2900 = ₹3900.$

∴ Ans = ₹3900

(ii) To Find: Amount paid in last instalment if total instalments = 40

Solution:

$a = ₹1000 \quad d = ₹100 \quad n = 40$

$a_n = a + (n-1)d$

$\Rightarrow a_{10} = ₹1000 + (40-1) \times ₹100$

$= ₹1000 + 3900 = ₹4900$

$\therefore$ Ans = ₹4900

(iii) (b) To Find: Ratio of 10th instalment to last instalment.

Solution:

Amount paid in 10th instalment = a_{10}

$a = ₹1000 \quad d = ₹100 \quad n = 10$.

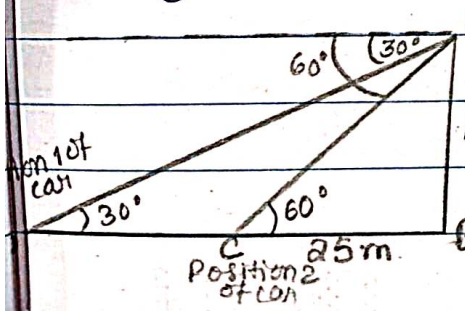
$a_n = a + (n-1)d$

$\Rightarrow a_{10} = ₹1000 + (10-1) \times ₹100 = ₹1000 + ₹900 = ₹1900$.

Amount paid in last instalment = ₹4900 (from iii)

Ratio: $\frac{₹1900}{₹4900} = \frac{19}{49} = 19:49$.

$\therefore$ Ans = 19 : 49



Given: initial angle of depression = 30° of car.

final angle of depression = 60°

distance from building = 25m.

(i) To Find: Height of building

Solution:

In $\triangle ABC$, $\tan C = \tan 60° = \frac{AB}{BC}$

$\Rightarrow \tan 60° = \frac{AB}{25m} = \sqrt{3} \Rightarrow AB = 25\sqrt{3}m.$

$\therefore$ Building height $= 25\sqrt{3}m. \approx 43.3m.$

(ii) To Find: Distance between two positions of the car.

Solution:

In $\triangle ABD$, $\tan D = \tan 30° = \frac{AB}{BD}$

$\Rightarrow \tan 30° = \frac{25\sqrt{3}m}{BD.} = \frac{1}{\sqrt{3}}$

$\Rightarrow BD = 75m.$

$BC = 25m$ (given)

Distance between two positions $= BD - BC = 75m - 25m$

$= 50m.$

$\therefore$ Ans $= 50m.$

(b)

(iii) To Find: Distance of observer from car when it makes 60° angle.

Solution:

For situation of 60° angle, $\triangle ABC$ is taken into consideration.

$\cos 60° = \frac{BC}{AC} \Rightarrow \cos 60° = \frac{25m}{AC} = \frac{1}{2} \Rightarrow AC = 50m.$

∴ As observer is at A and car is at C, distance AC between them is 50m.

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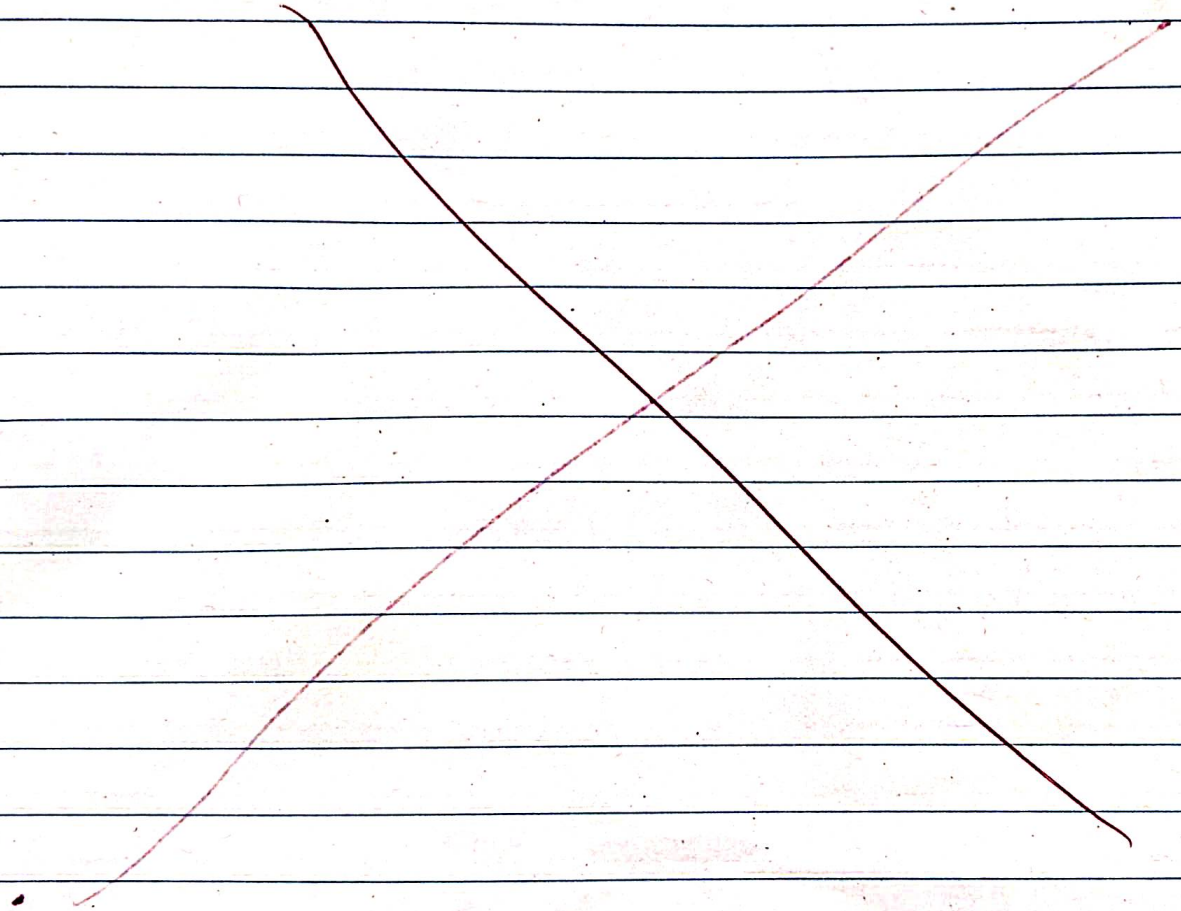

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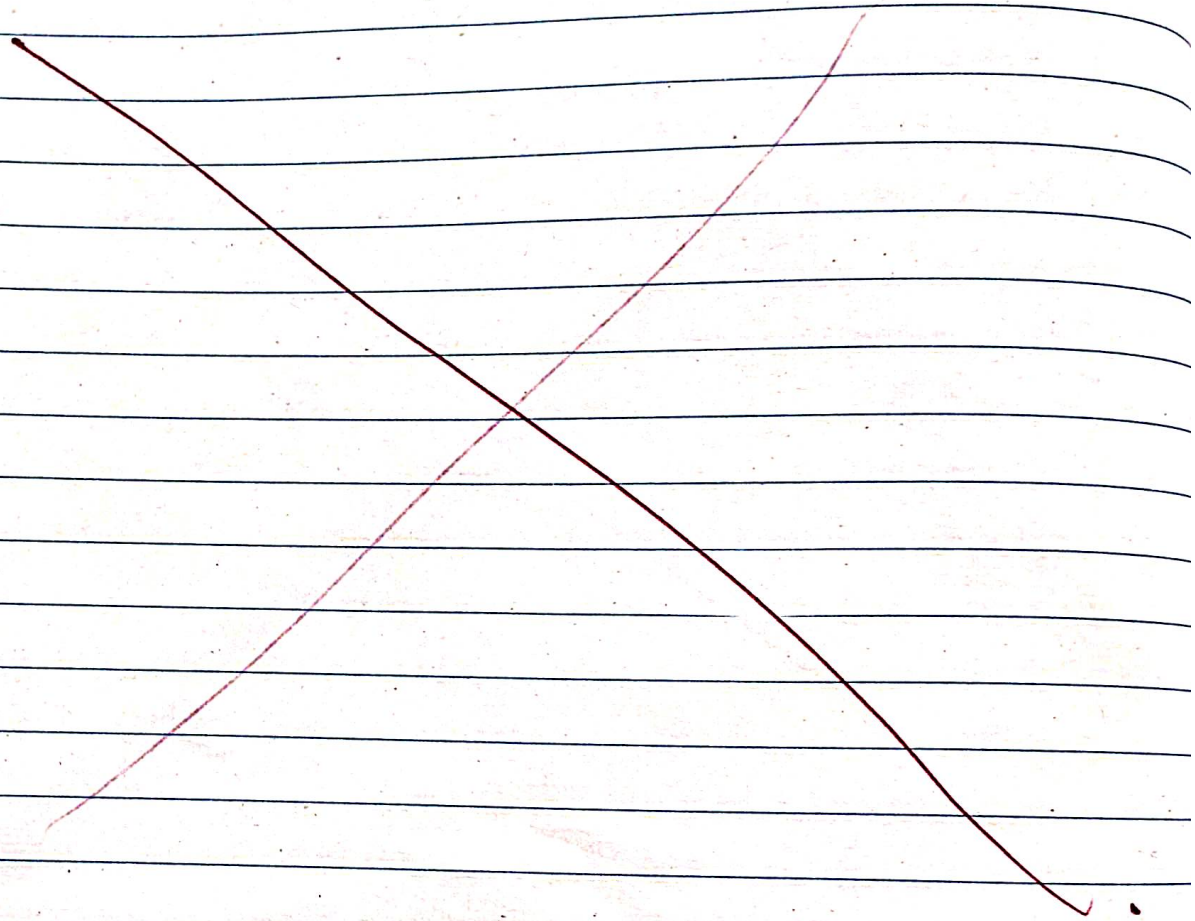

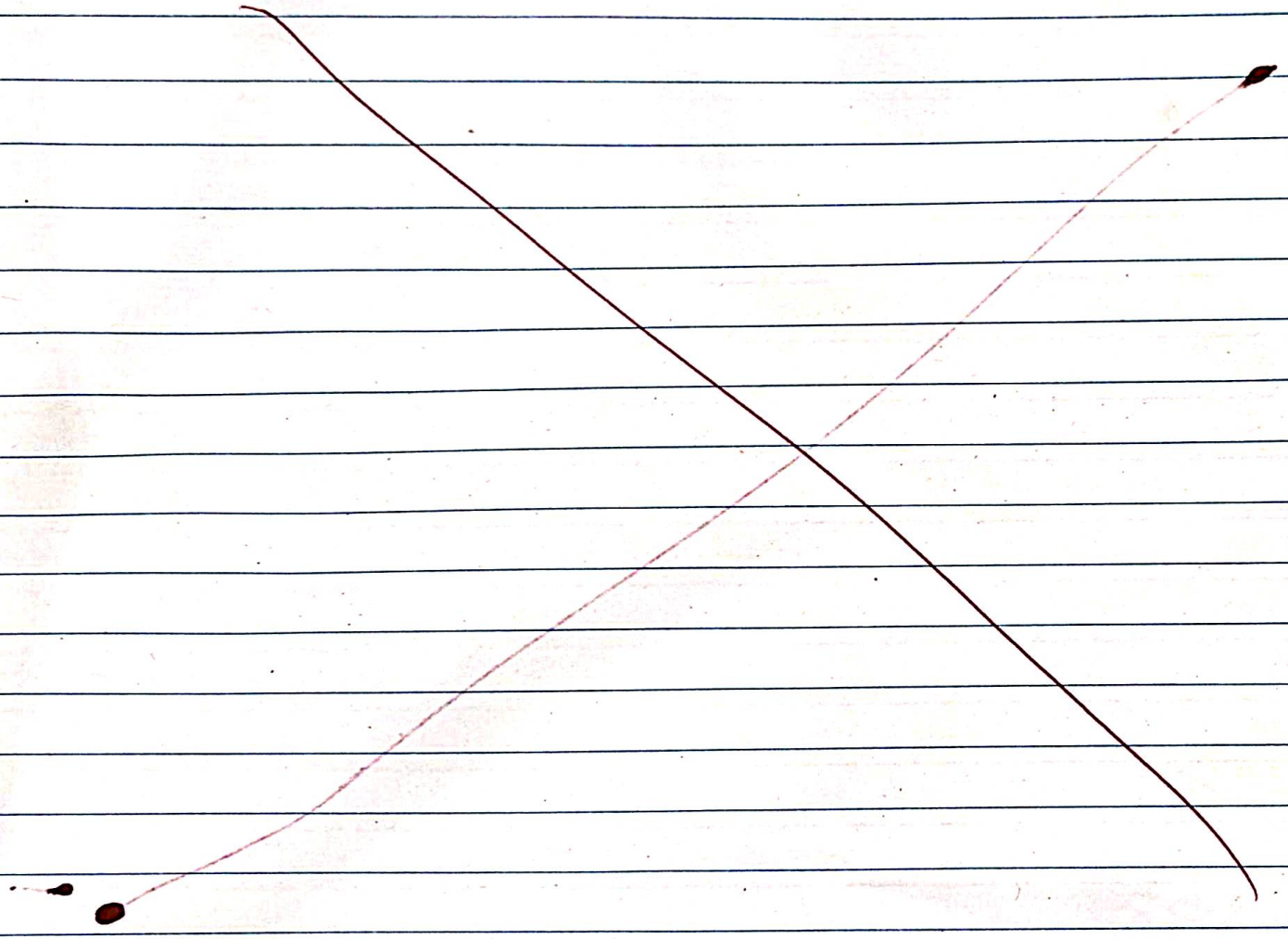

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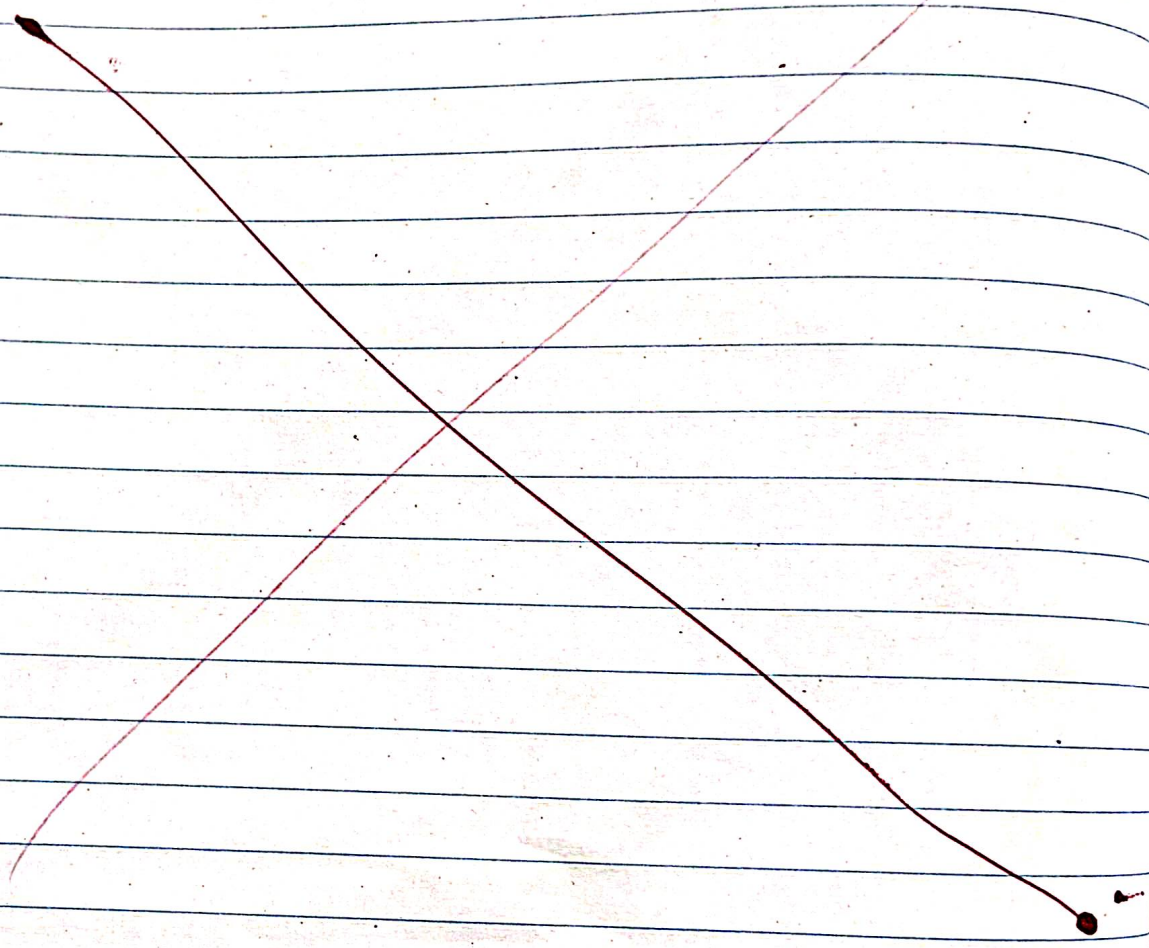

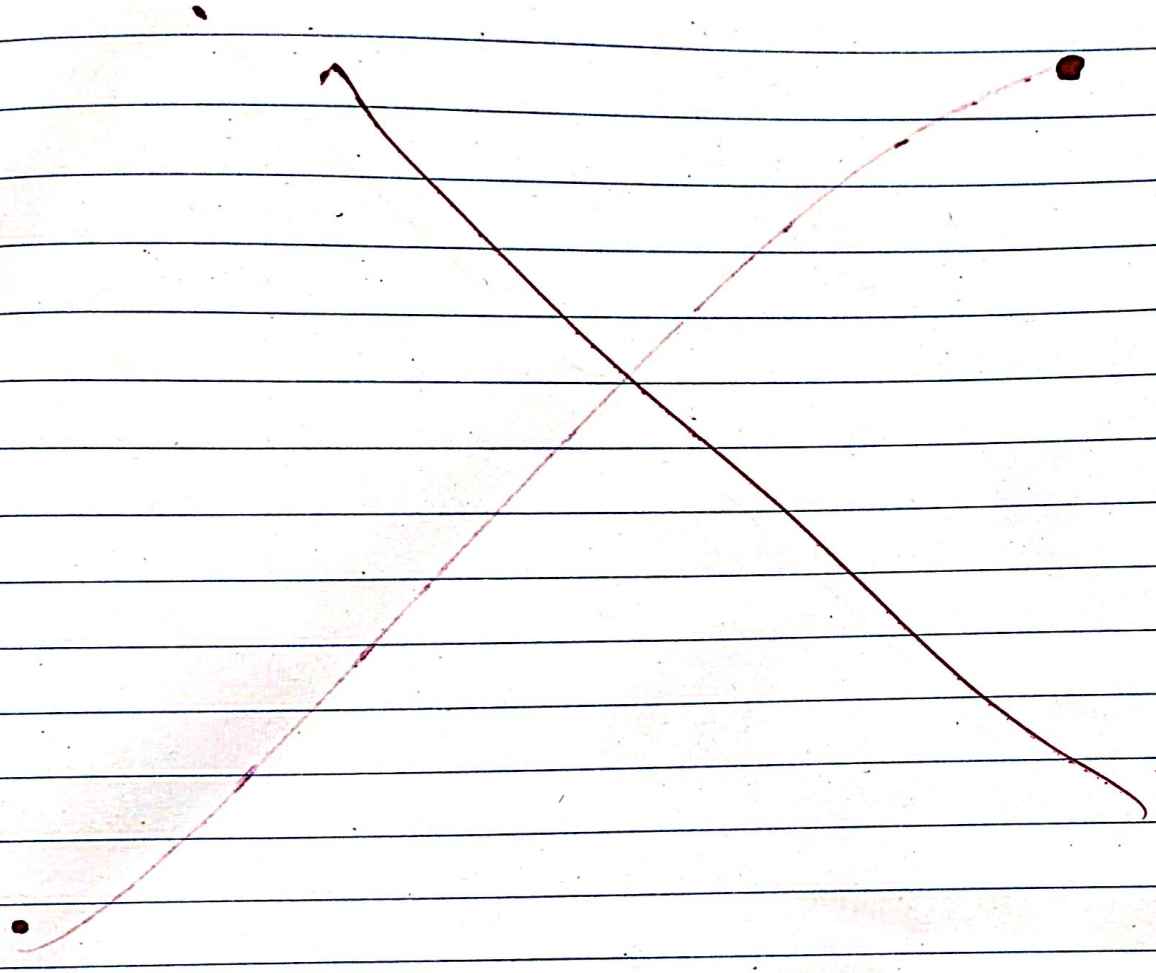

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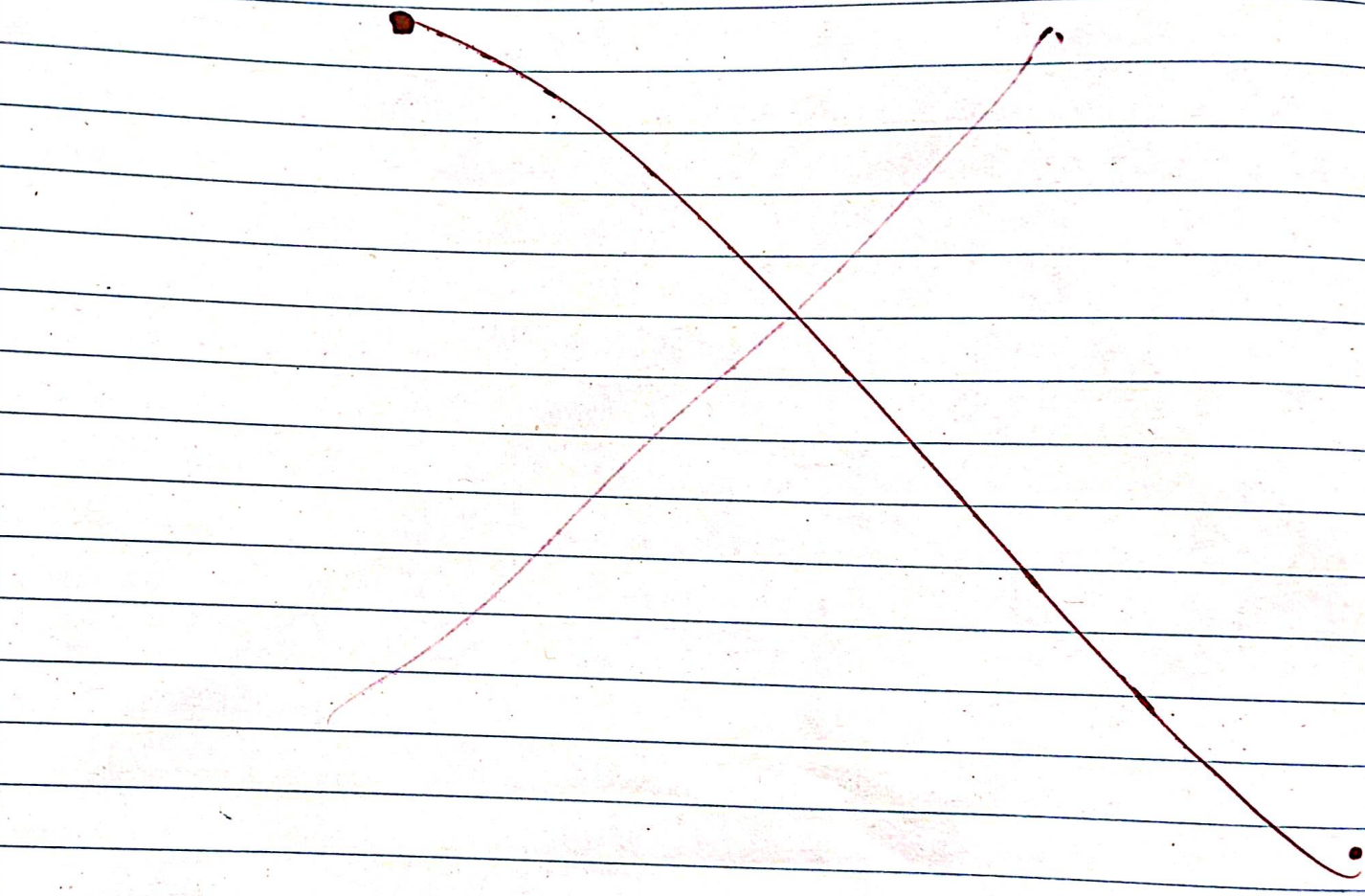

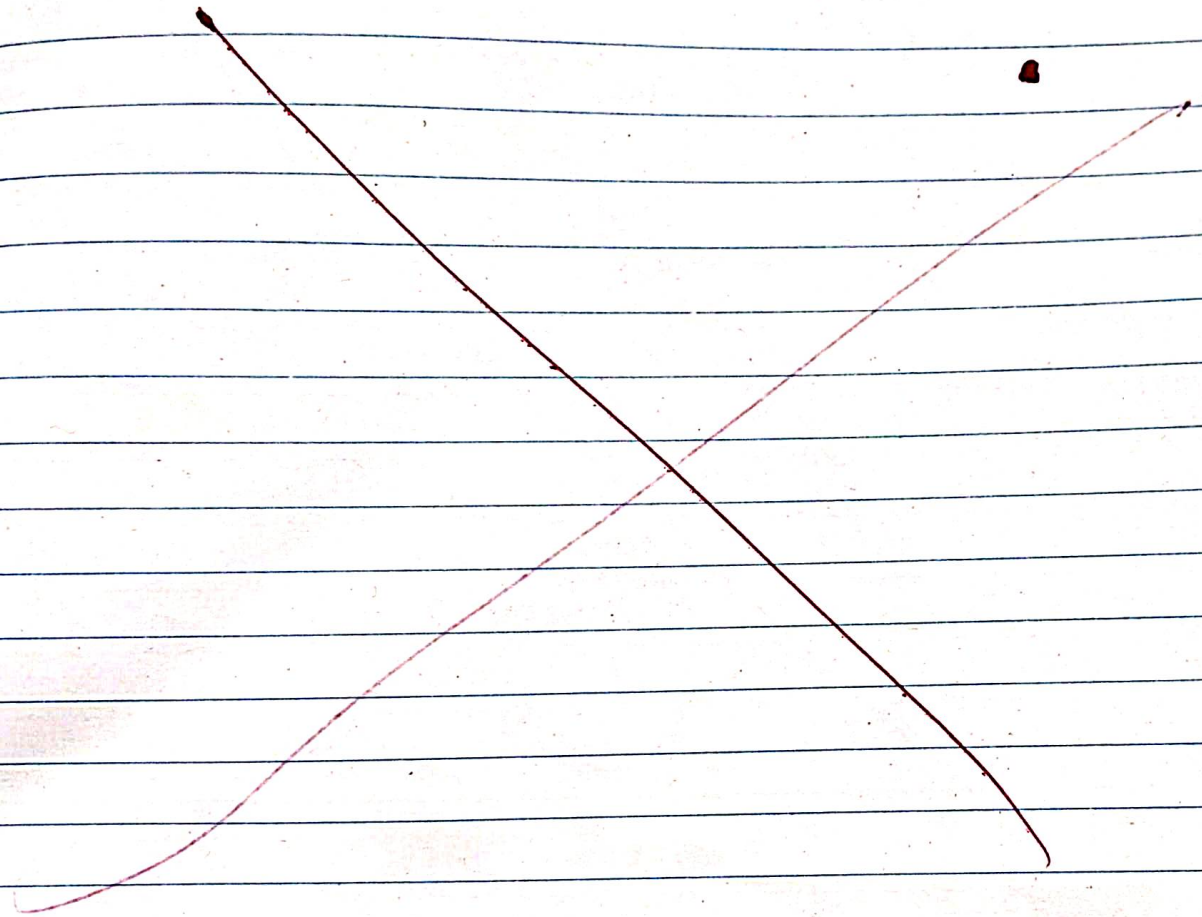

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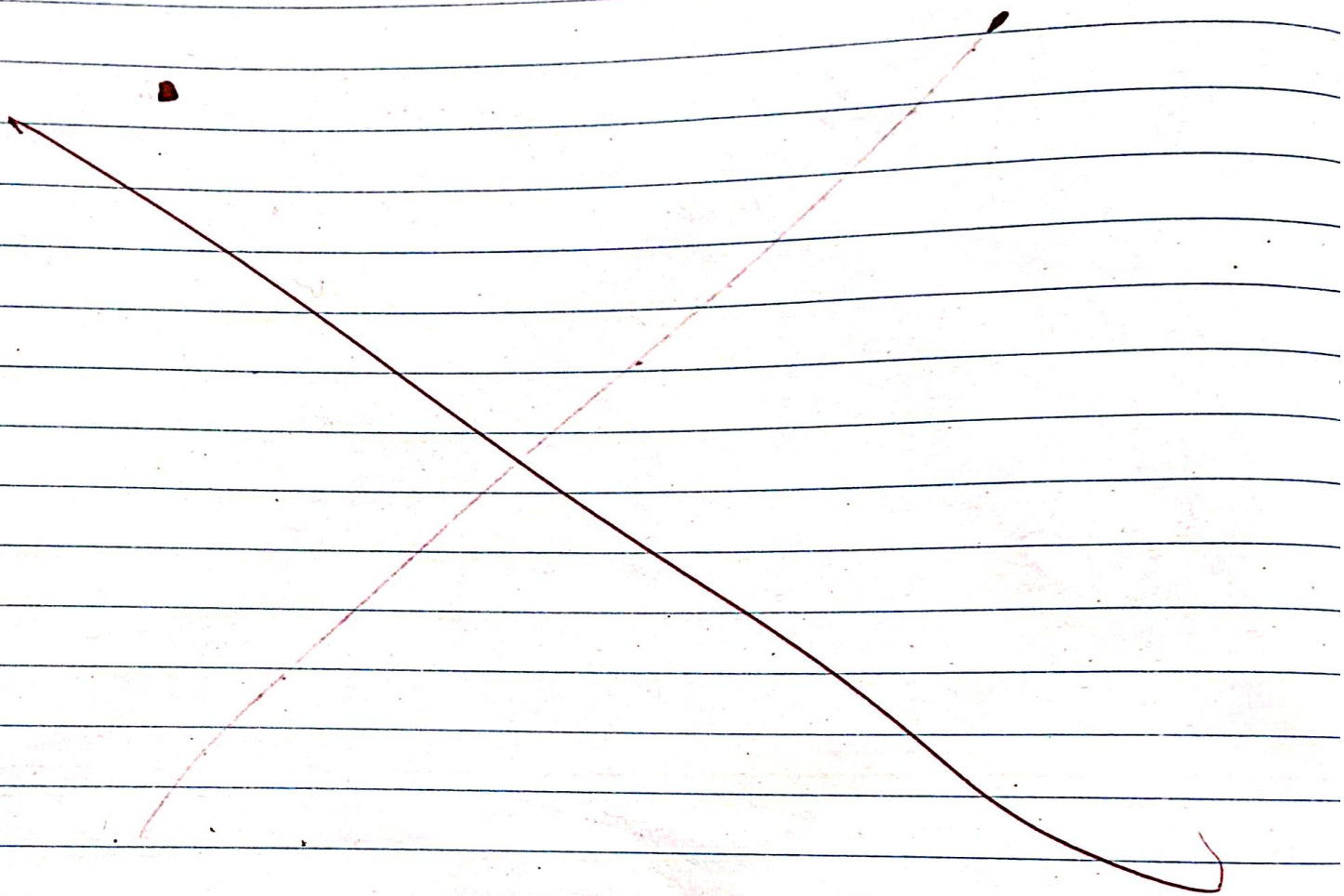

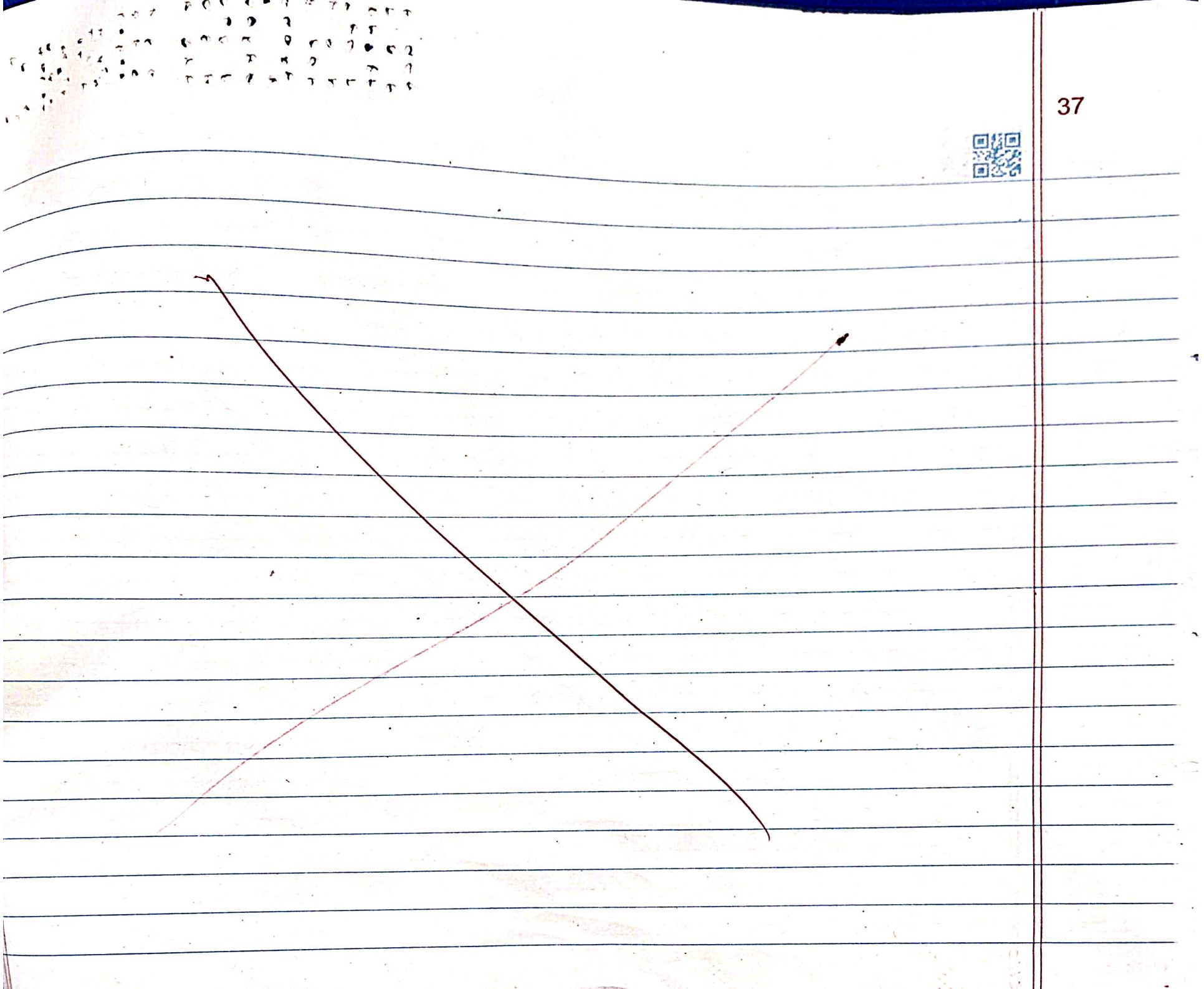

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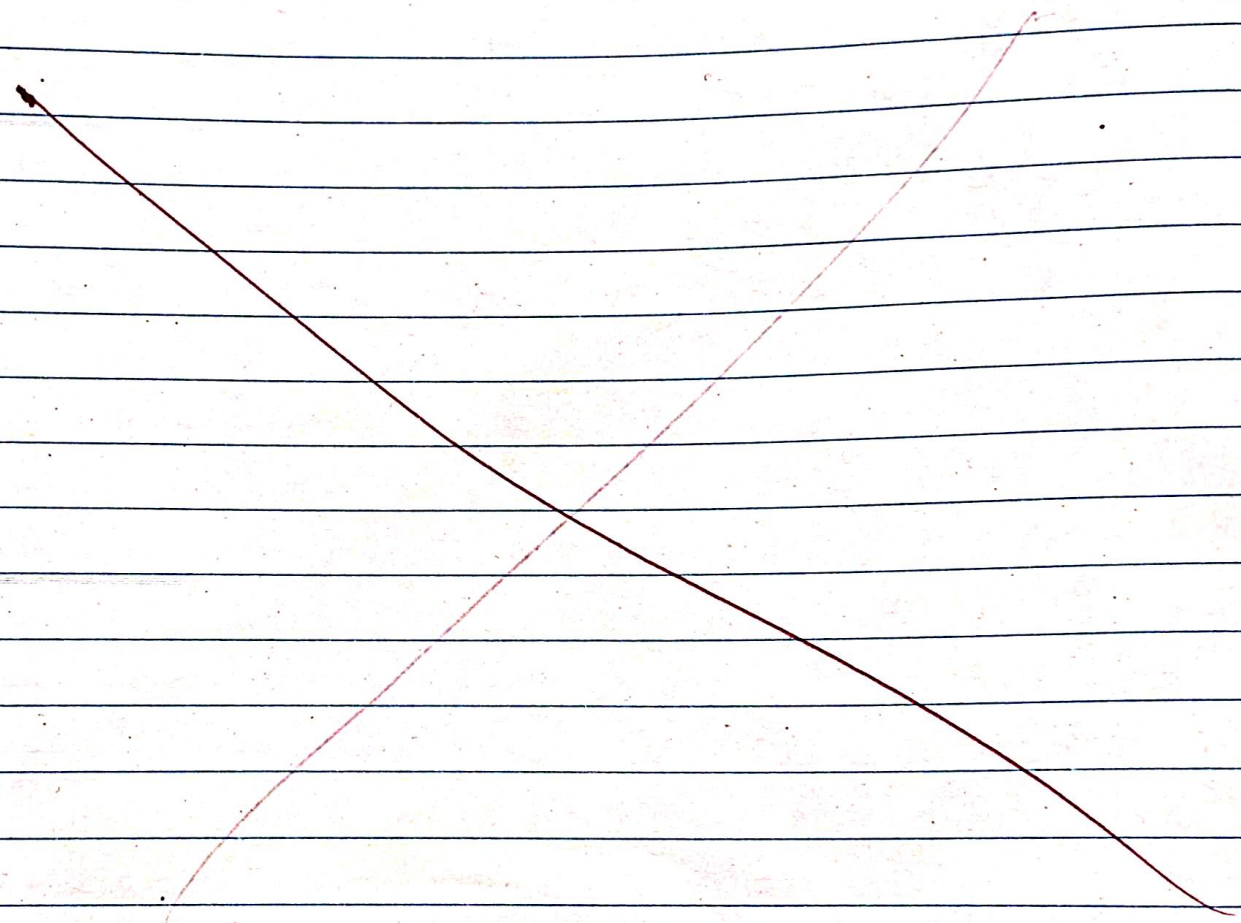

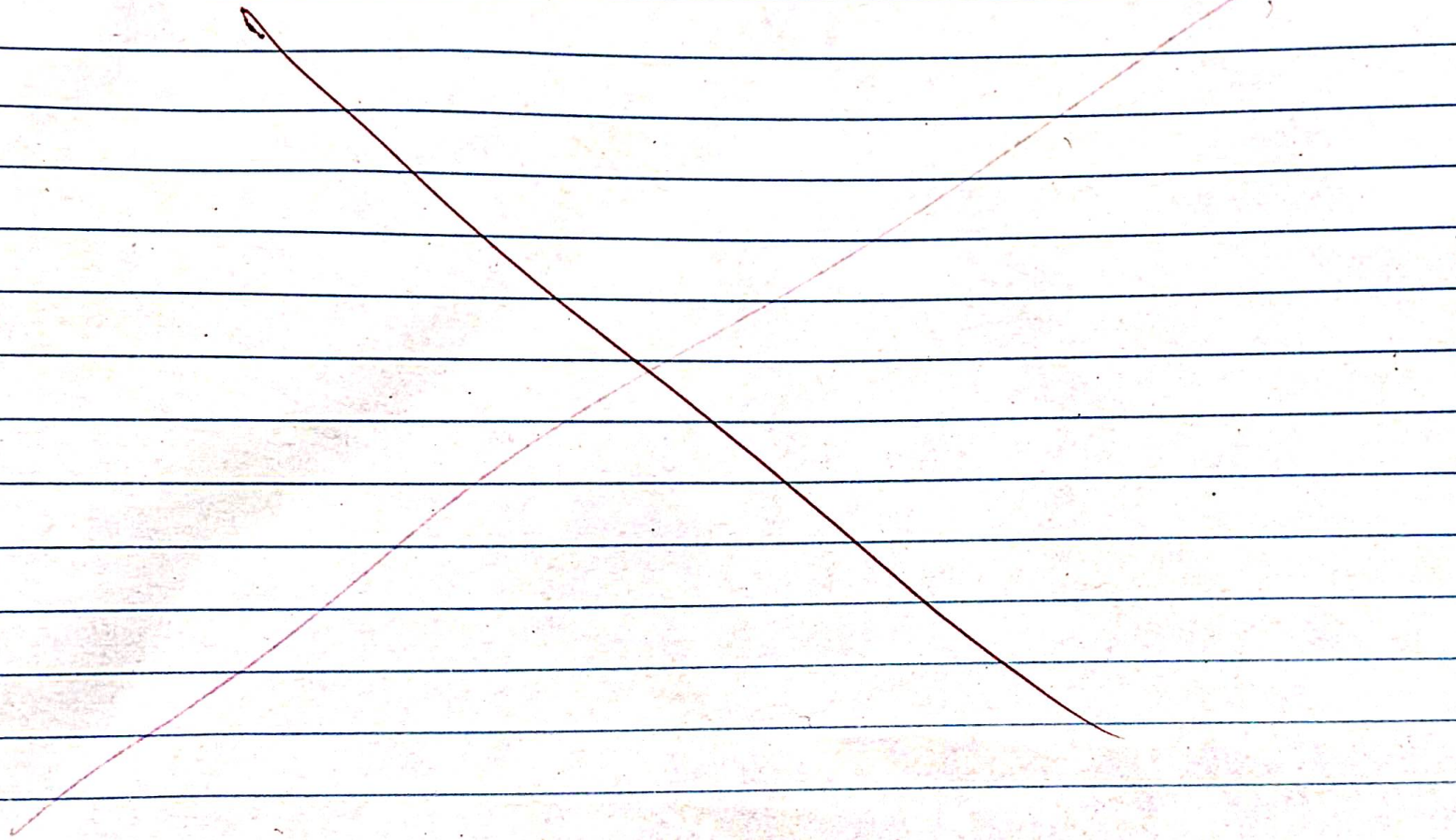

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