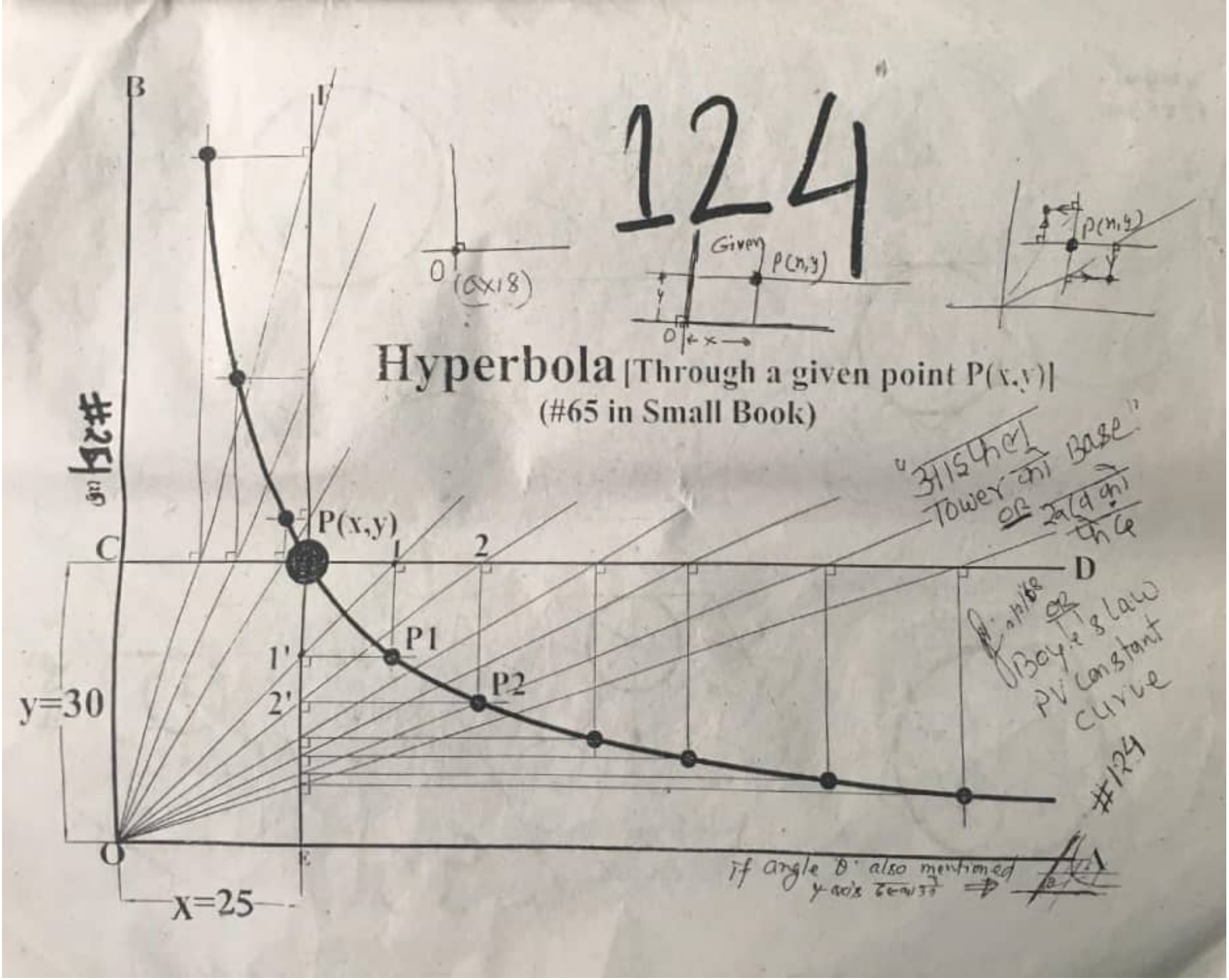
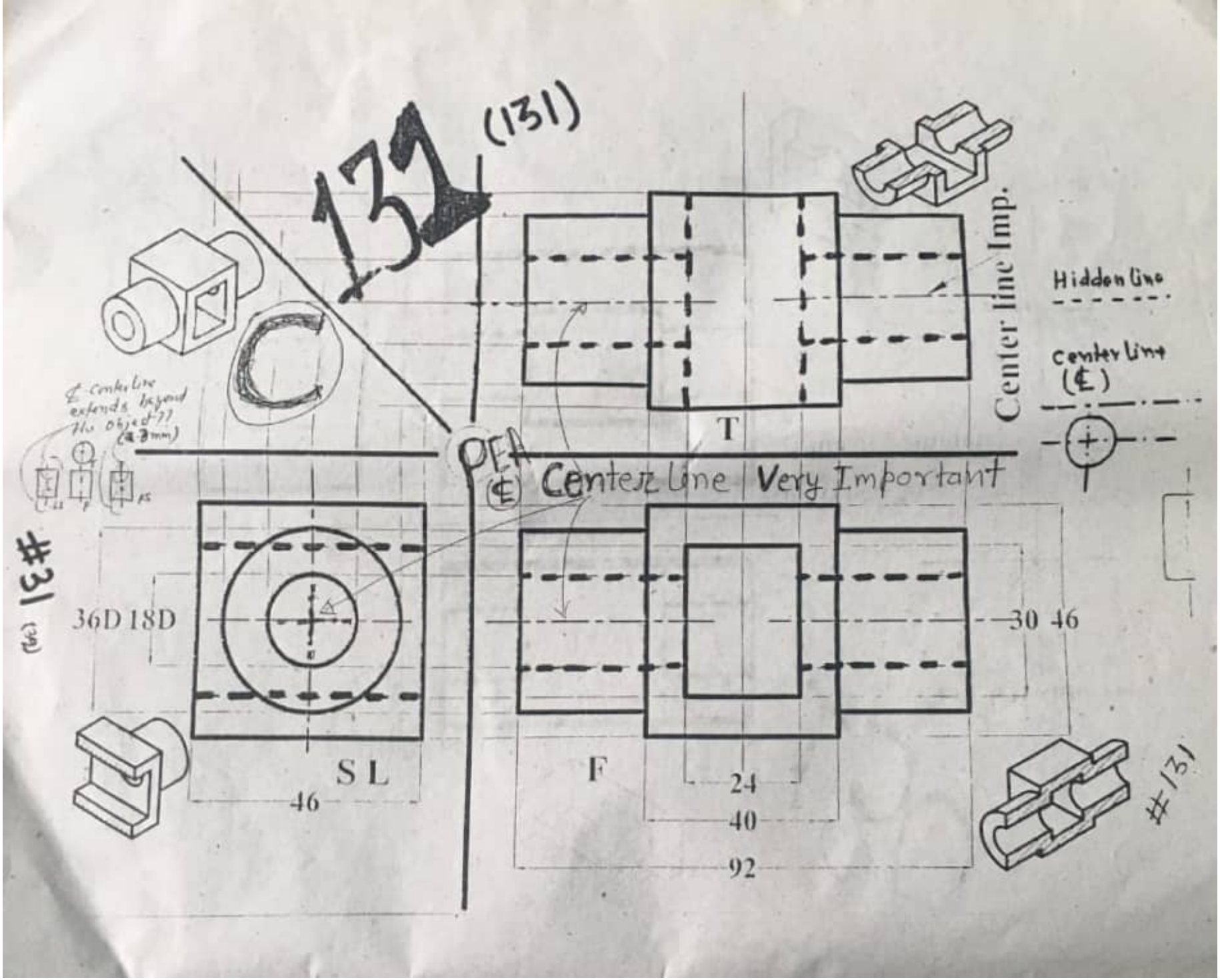
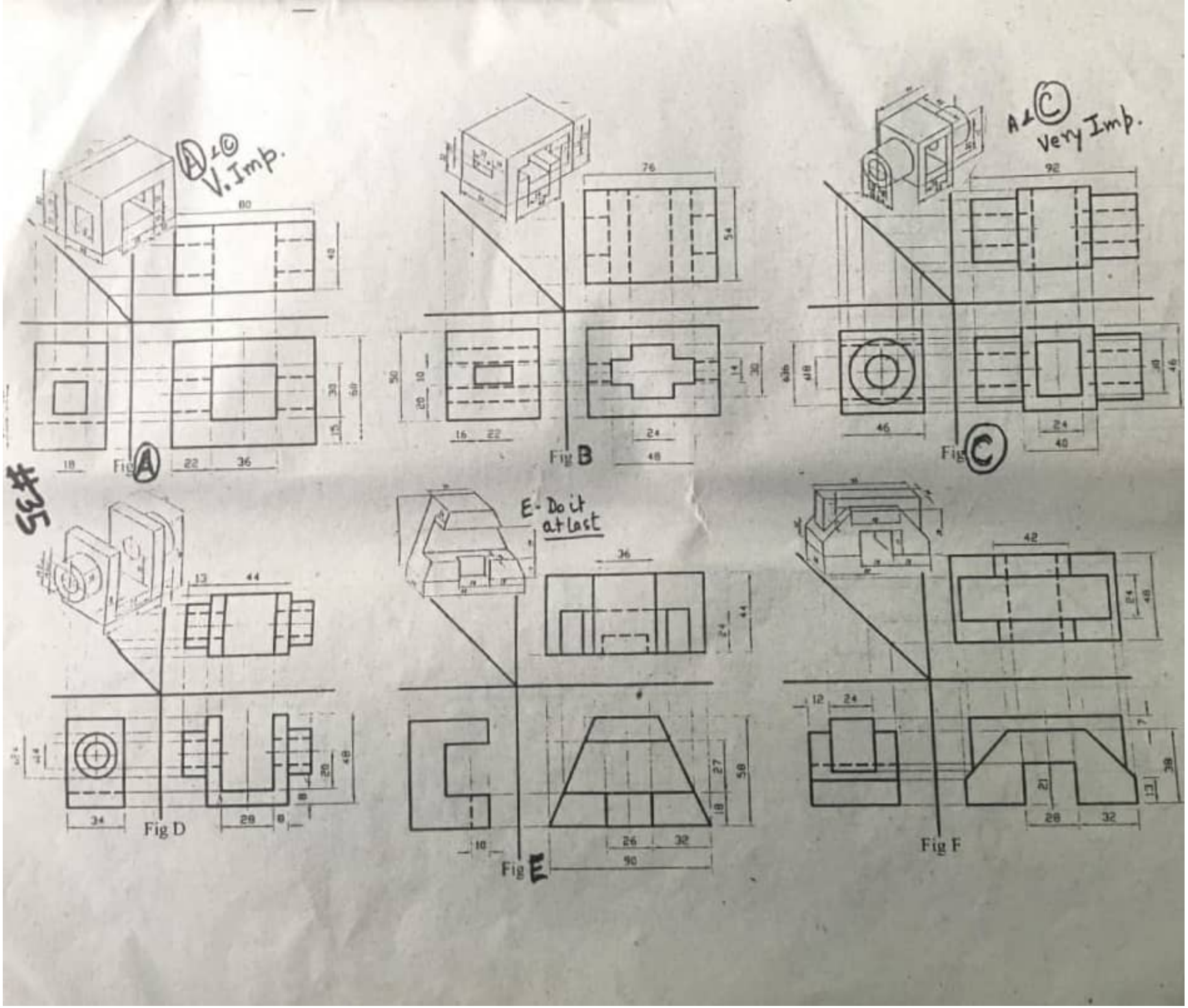
#28
80 More Practice Q's for Better
'Concept Building' in 3 Views.
- show the angle in Freehand sketch.

#38

- Show the ones in Free hand sketch.


124
Hyperbola [Through a given point P(x,y)]
(#65 in Small Book)
B
A
C
D
O
P(x,y)
P1
P2
1
2
1'
2'
y=30
X=25
O (0x18)
Given
P(x,y)
O ← x →
P(x,y)
#124
if angle θ also mentioned
y-axis zero ⇒

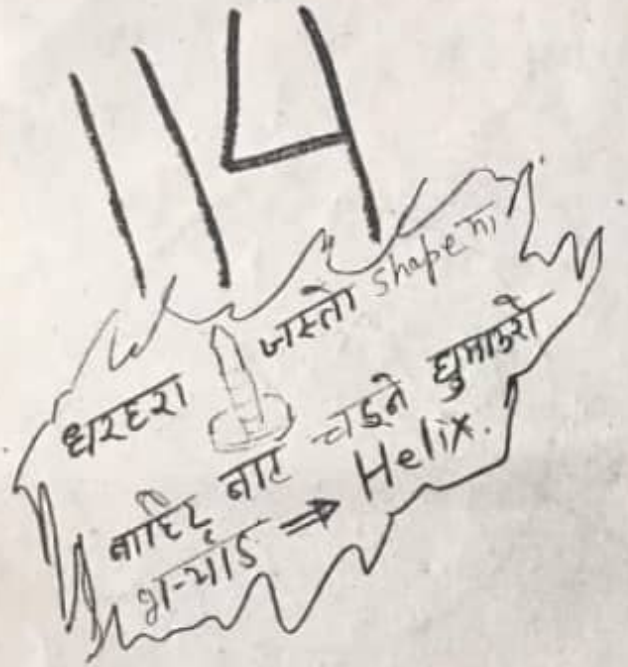

137
(131)
C
T
Center line Imp.
Hidden line
Center line
(℄)
℄ center line extends beyond the object 77 (3mm)
℄ Center line Very Important
36D 18D
30 46
S L
46
F
24
40
92
#131
#131

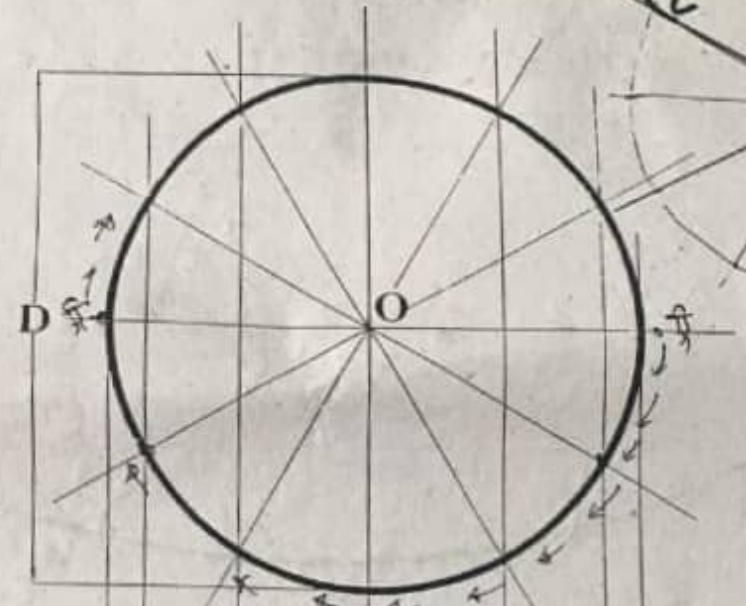

A & C V. Imp.
Fig A
Fig B
A & C Very Imp.
Fig C
SET
Fig D
E- Do it at last
Fig E
Fig F

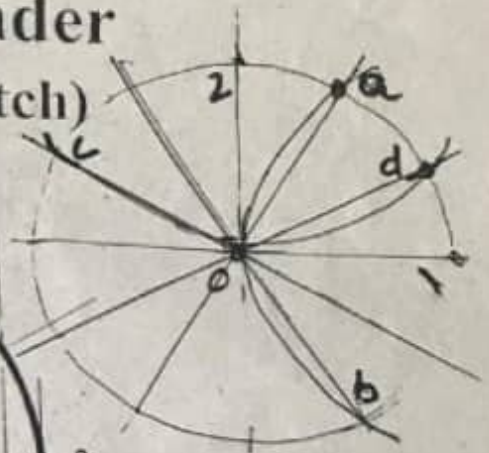
Q. 2 (m) Helix on a cylinder

(Given: Diameter & Pitch)

(#67 in Small Book)







12 div Easy method

If 'h' also given Repeat the curve until 'h' height.

Half Hidden Curve

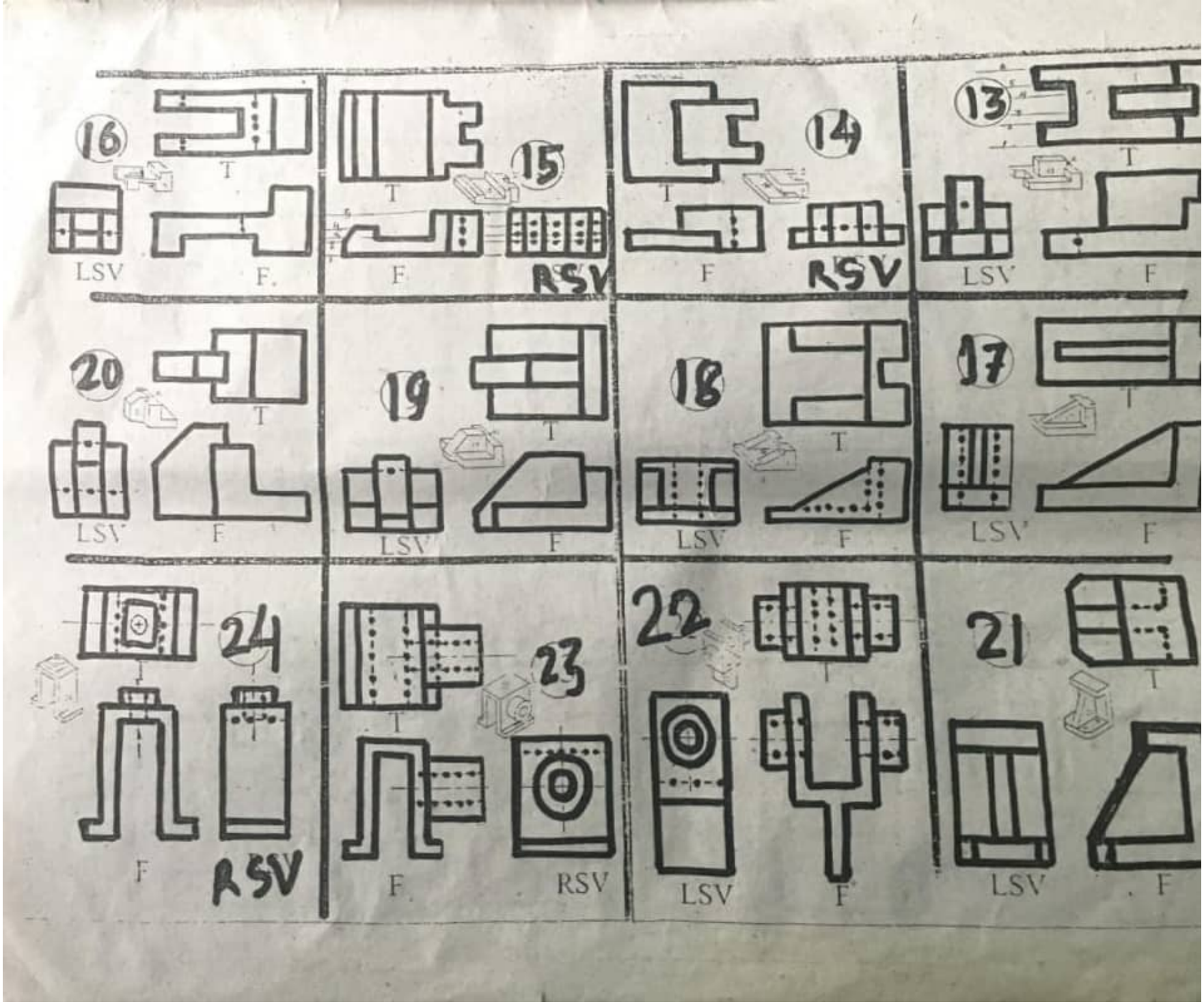
12 equal division by 'a' method

Pitch/Lead

Ground

Note :- if n2P given H2

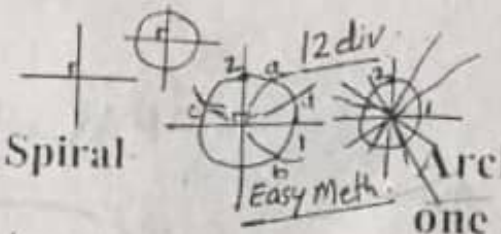
#114

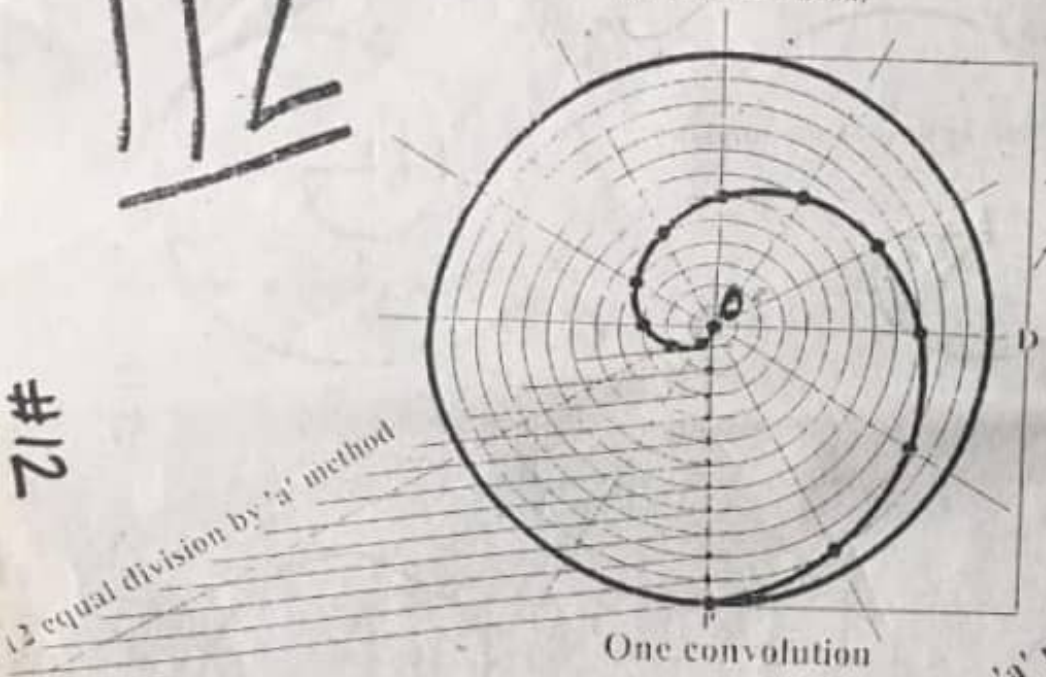

16
T
LSV
F.
15
T
F
RSV
14
T
F
RSV
13
T
LSV
F
20
T
LSV
F
19
T
LSV
F
18
T
LSV
F
17
T
LSV
F
24
F
RSV
23
T
F
RSV
22
T
LSV
F
21
T
LSV
F

112

Q2. (k) Archemedian Spiral

(#65 in Small Book)





Free hand (or french curve) at last

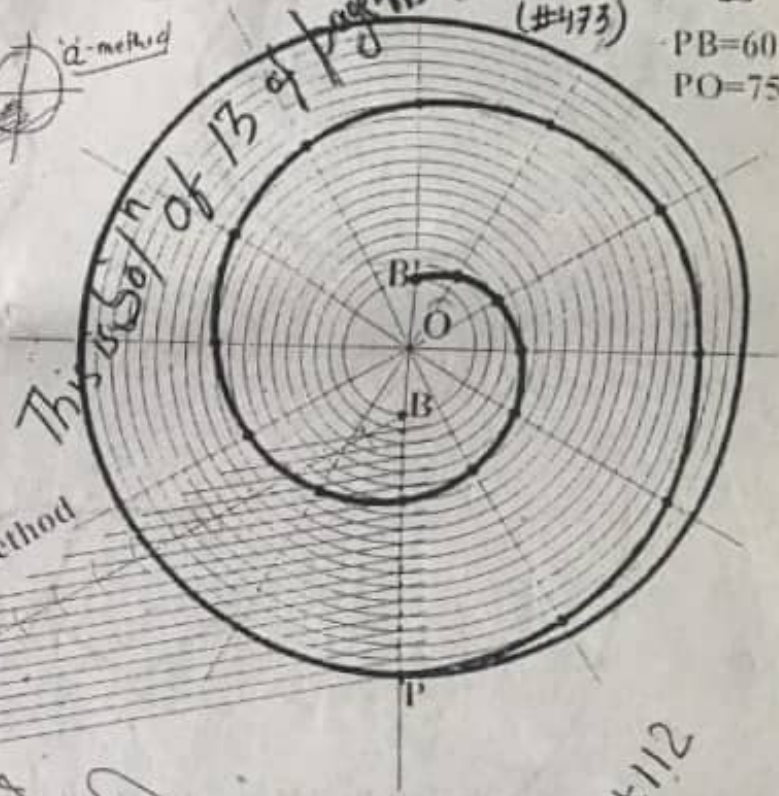
Archemedian Spiral in one and half convolution

(#[illegible] QB. Vol. 2) Q No 13

(#173)

PB=60

PO=75

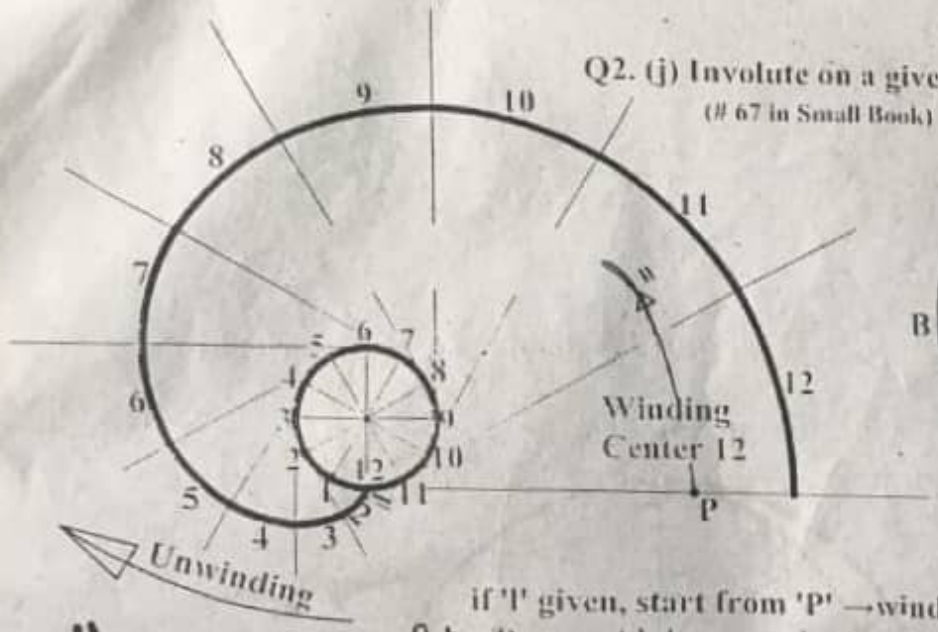


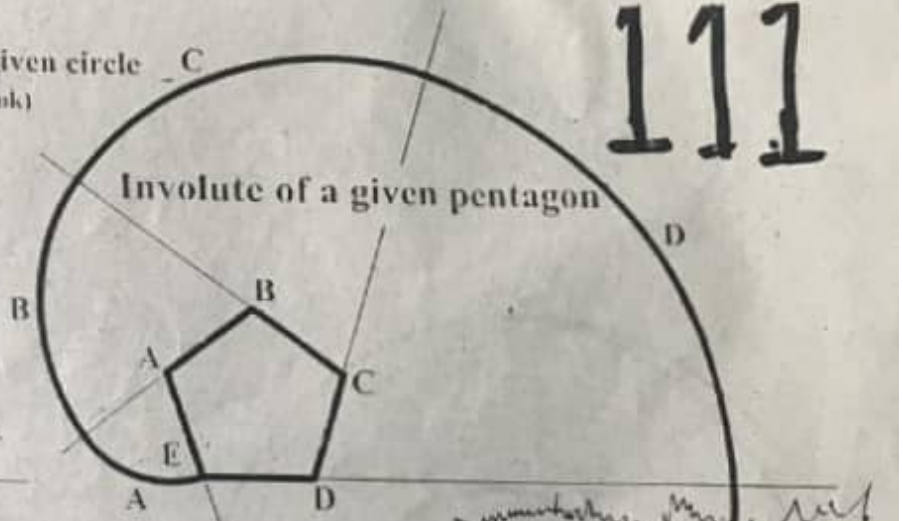
माकुराको जोला भत्ते दैरिवन्छ ।

2/2/067 #112

111

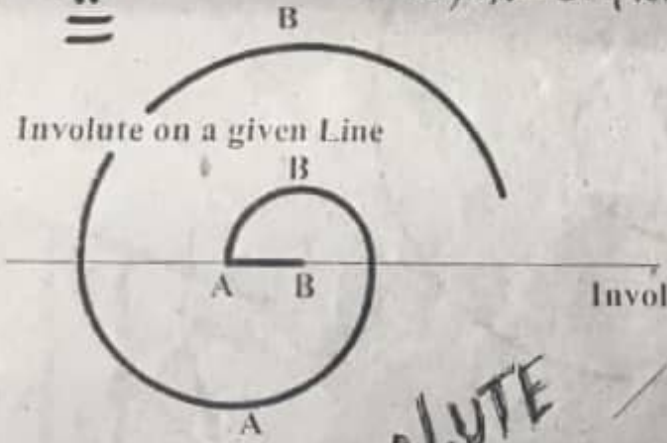
Q2. (j) Involute on a given circle
(# 67 in Small Book)

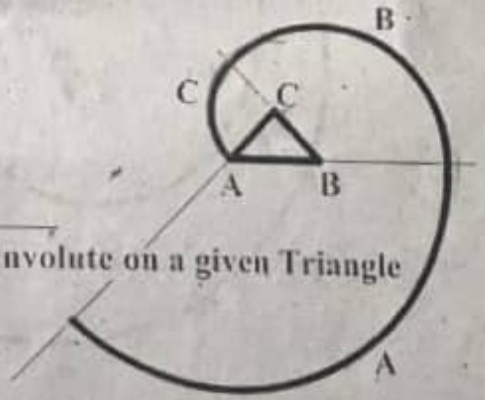


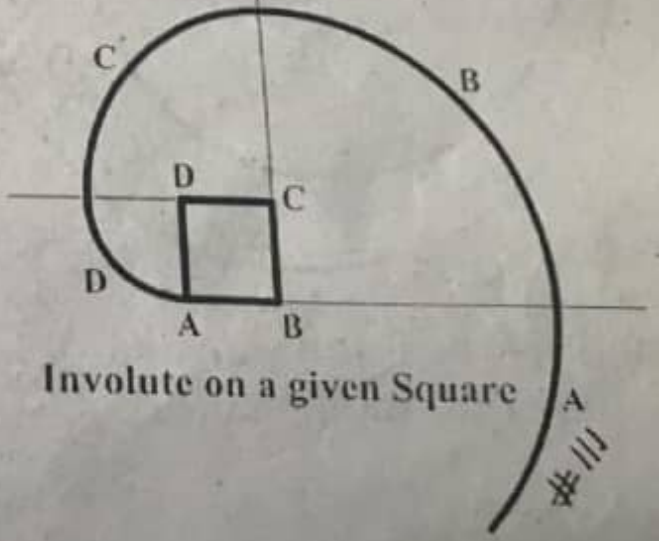


if 'I' given, start from 'P' → winding
But, after completion winding or unwinding-something

Practice with a Rope at HOME!!!

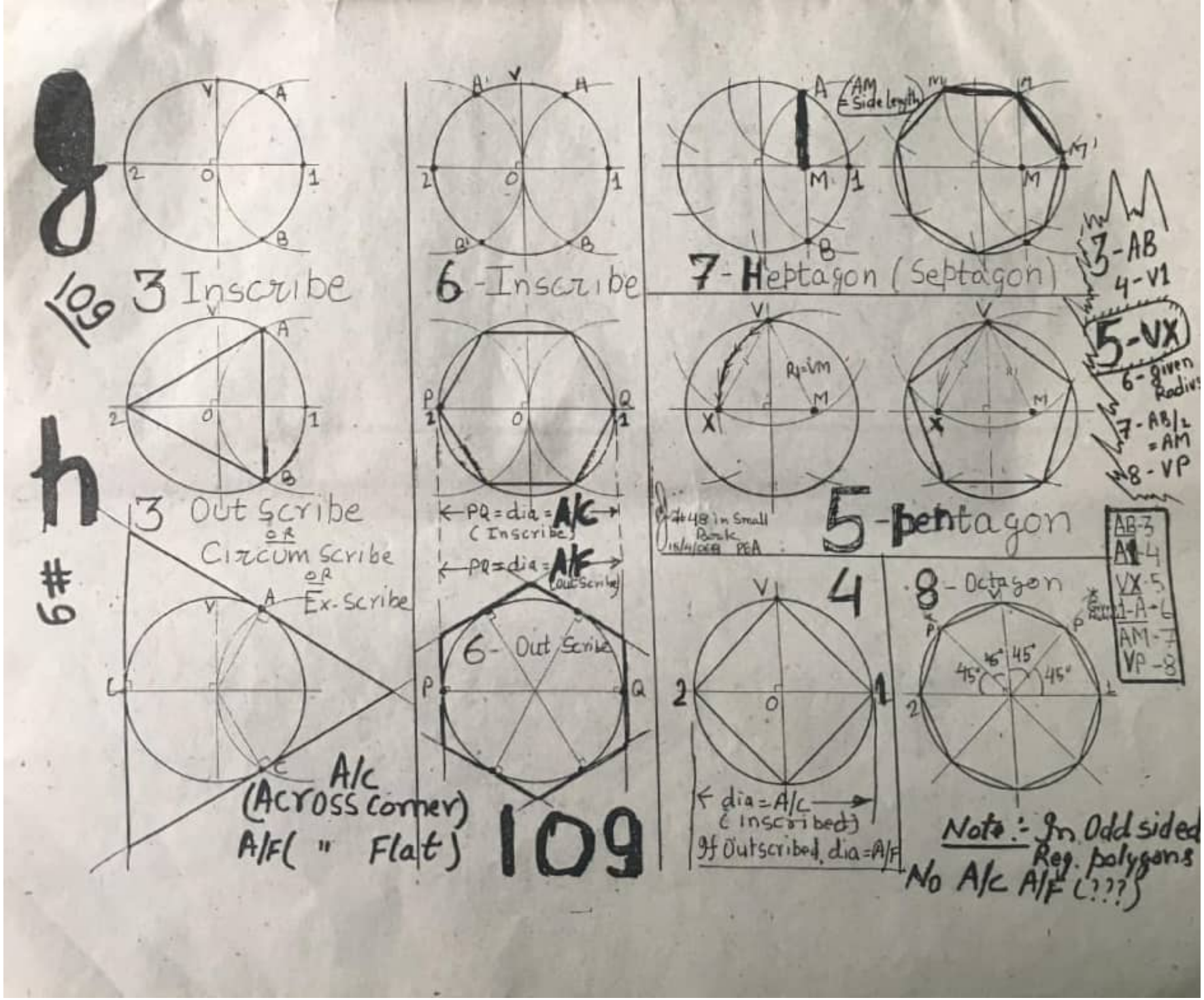


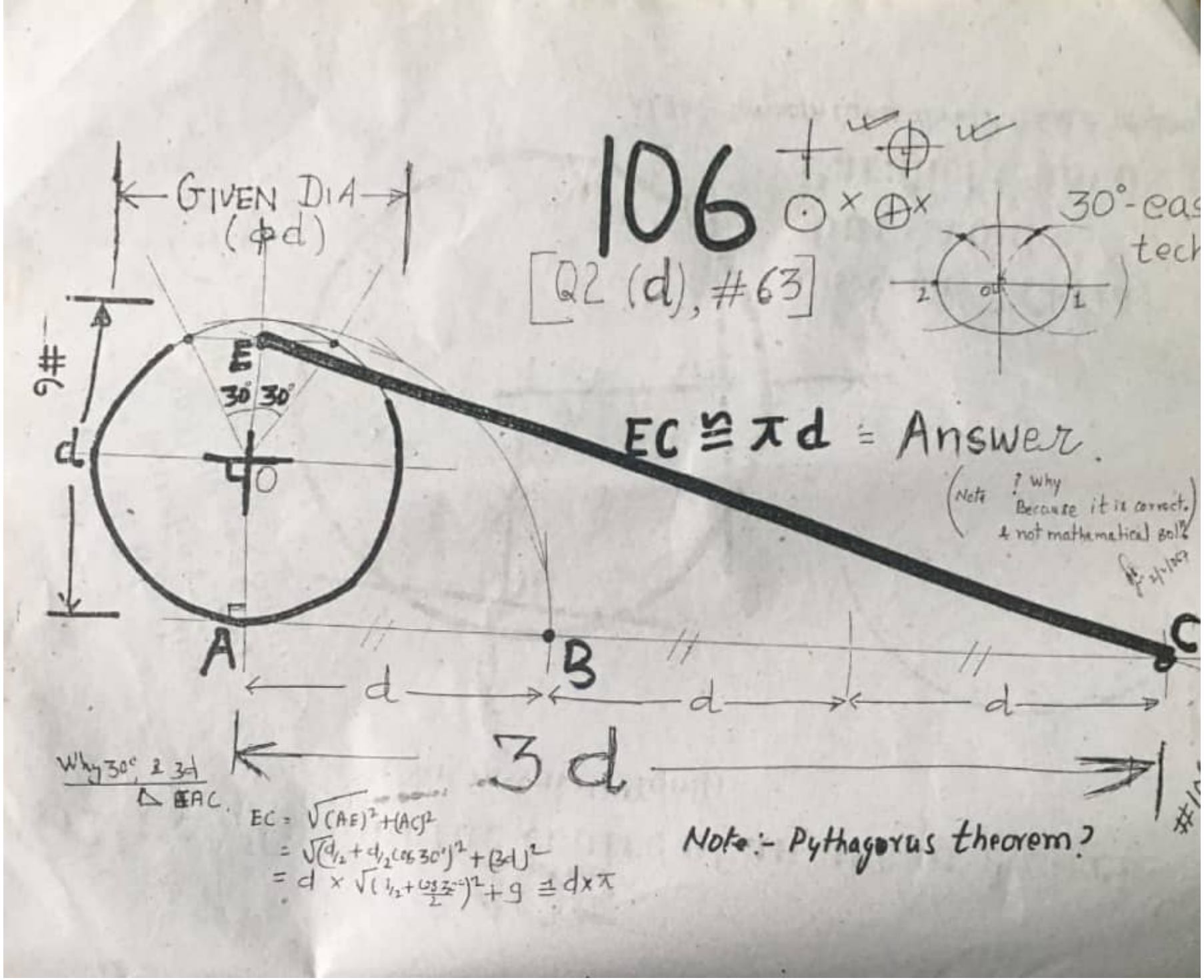


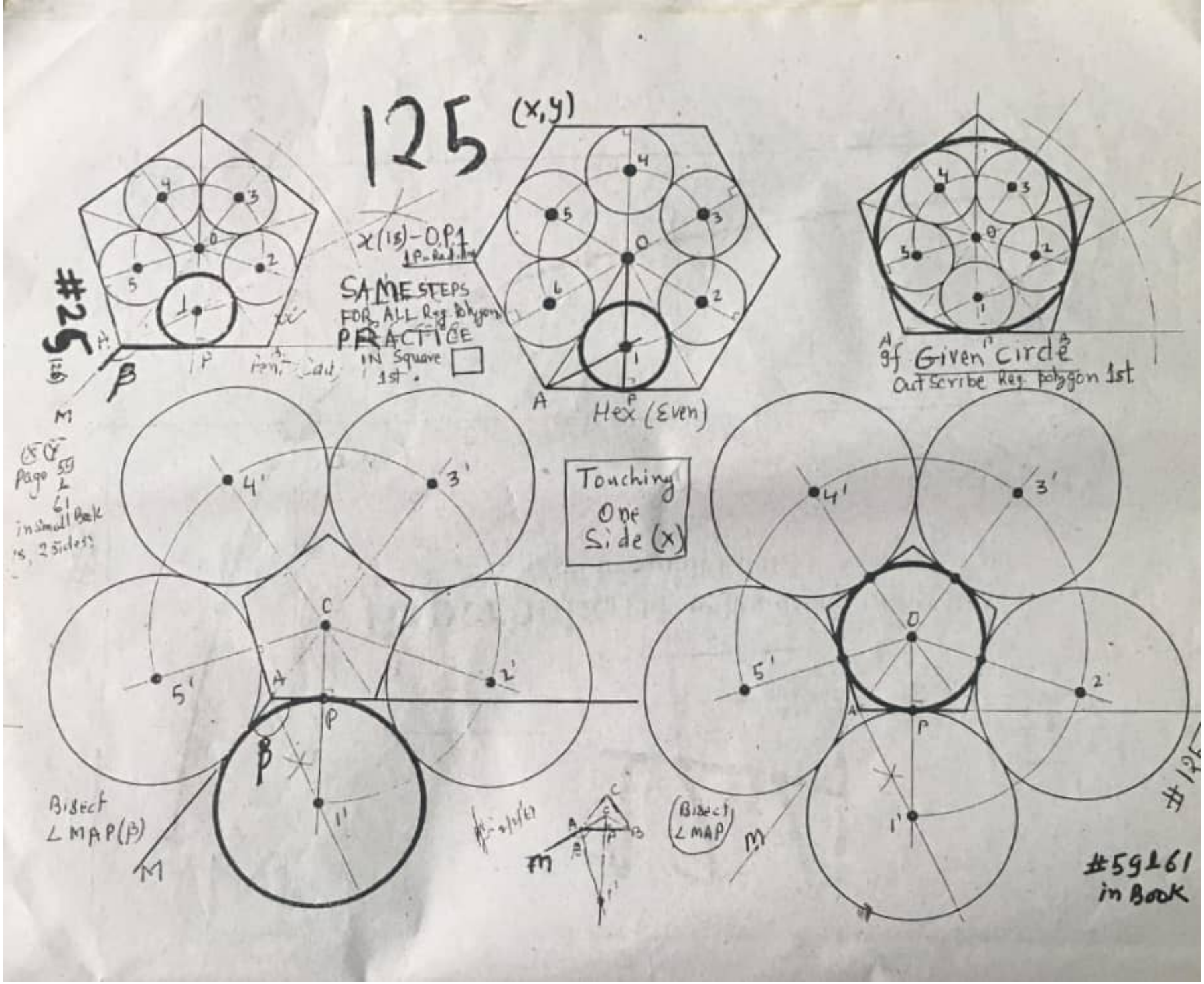


INVOLUTE
All Instrument Work

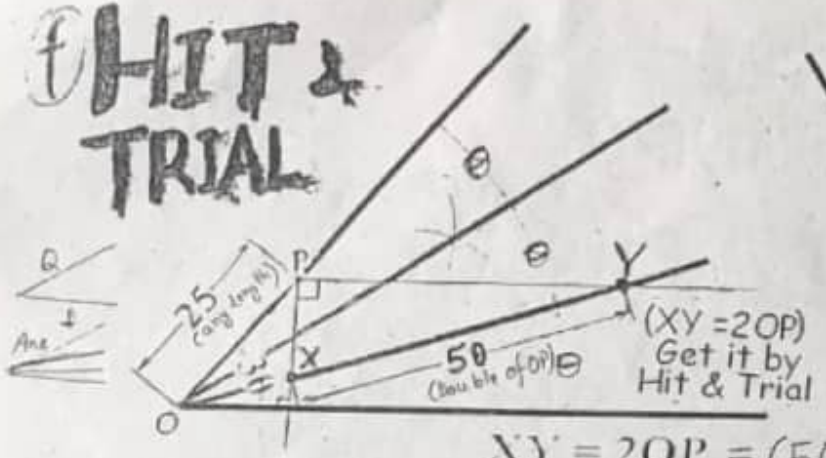
#111


g
109
3 Inscribe
V
A
2
O
1
B
6 - Inscribe
V
A
2
O
1
B
7 - Heptagon (Septagon)
A
(AM = Side length)
M
1
B
3 - AB
4 - V1
5 - VX
6 - given Radius
7 - AB/2 = AM
8 - VP
h
#48 in Small Book
5 - pentagon
3 Out Scribe
OR
Circum Scribe
OR
Ex-scribe
A
V
C
A/C
(Across corner)
A/F (" Flat)
PQ = dia = A/C
(Inscribed)
PQ = dia = A/F
(Outscribed)
6 - Out Scribe
P
Q
4
V
2
O
1
dia = A/C
(inscribed)
If Outscribed, dia = A/F
8 - Octagon
45°
AB - 3
A1 - 4
VX - 5
1-A - 6
AM - 7
VP - 8
Note :- In Odd sided Reg. polygons
No A/C A/F (???)
109


106
[Q2 (d), #63]
GIVEN DIA
(φd)
2#
d
E
30° 30°
O
A
B
C
d
d
d
3d
EC ≅ πd = Answer.
(Note ? Why
Because it is correct.
& not mathematical ball?
Why 30°, & 3d
△ EAC.
EC = √(AE)² + (AC)²
= √(d/2 + d/2 (cos 30°))² + (3d)²
= d × √(1/2 + cos 30°/2)² + 9 ≅ d × π
Note :- Pythagorus theorem?
30°-cas
tech
2
0
1

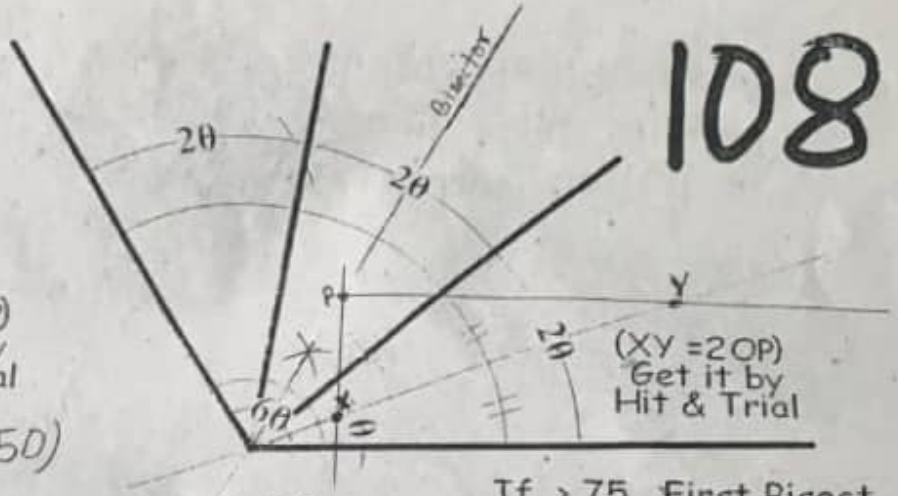

125 (x,y)
#25
SAME STEPS FOR ALL Reg. Polygons
PRACTICE
IN Square 1st.
Hex (Even)
Given circle
Touching One Side (x)
Bisect ∠ MAP (β)
Bisect ∠ MAP
#59161 in Book

(f) HIT & TRIAL



XY = 2OP = (50)

30θ → 25°-75°



If > 75 First Bisect then Trisect (XY = 2OP) then Double is Ans.

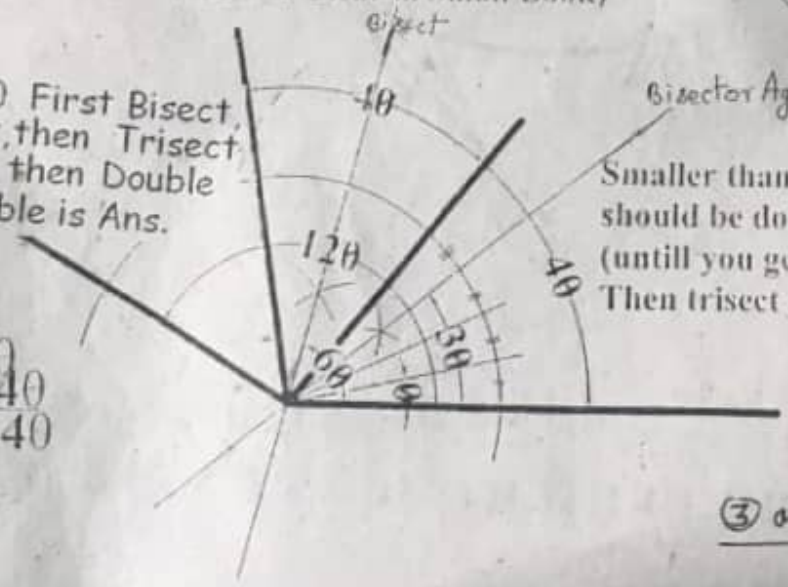
#88

Q2. (f) Trisecting an Angle

(#55 Not Clear in Small Book)

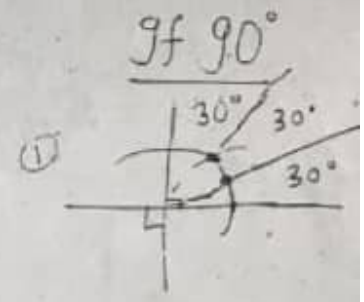
0
30 — 0
0

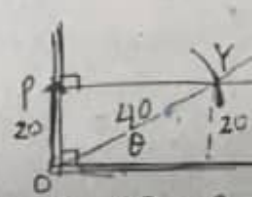
If >>> 150 First Bisect again bisect, then Trisect (XY = 2OP) then Double of Double is Ans.



Smaller than 25° Angles should be doubled (untill you get above 25°). Then trisect and then bisect.

120 | 40 | 40 | 40





(3) as above 6θ

21/9/67

$\sin\theta = \frac{20}{40} \Rightarrow \theta =$

$\theta = 30°$

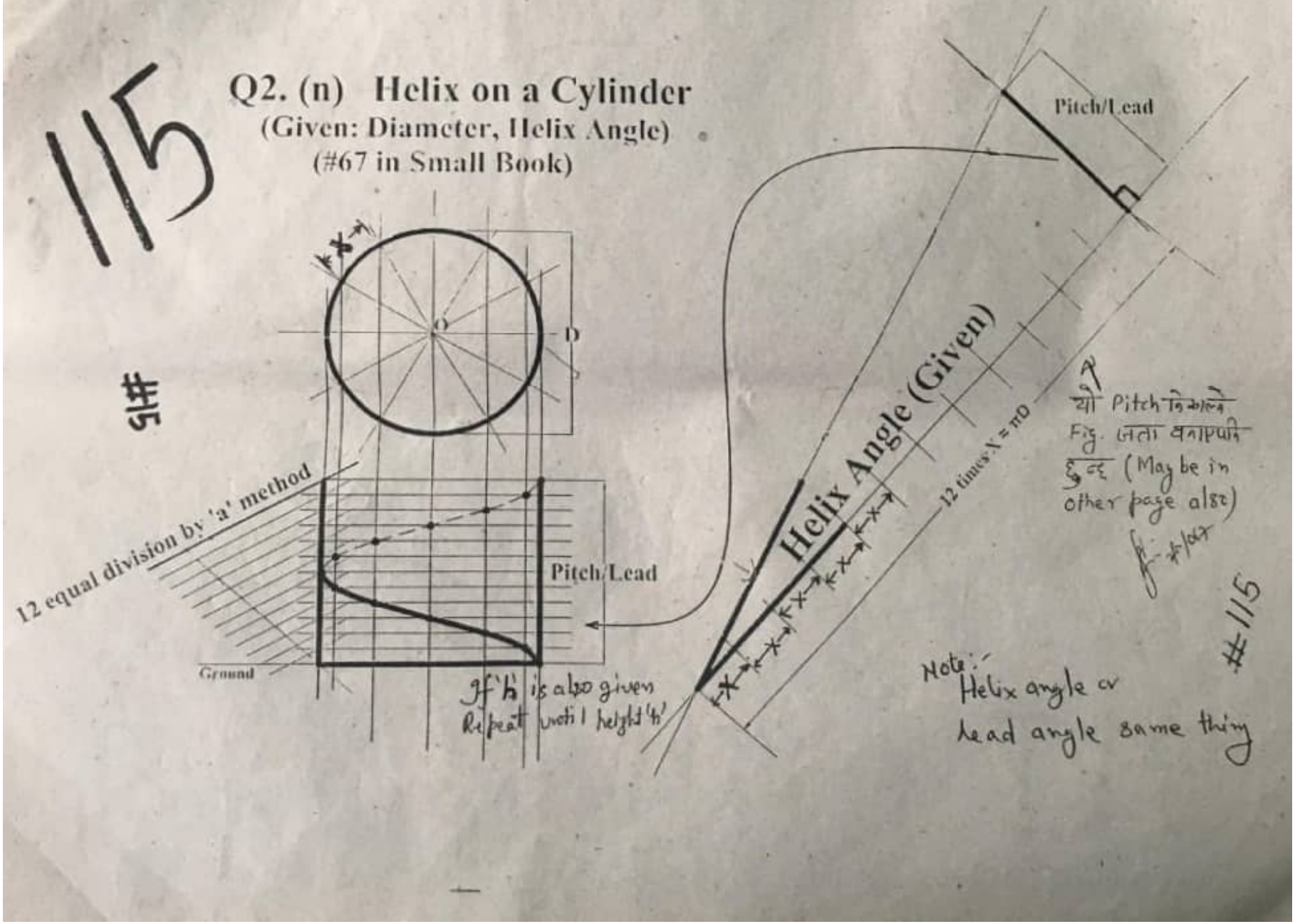
#108

115

Q2. (n) Helix on a Cylinder

(Given: Diameter, Helix Angle)

(#67 in Small Book)

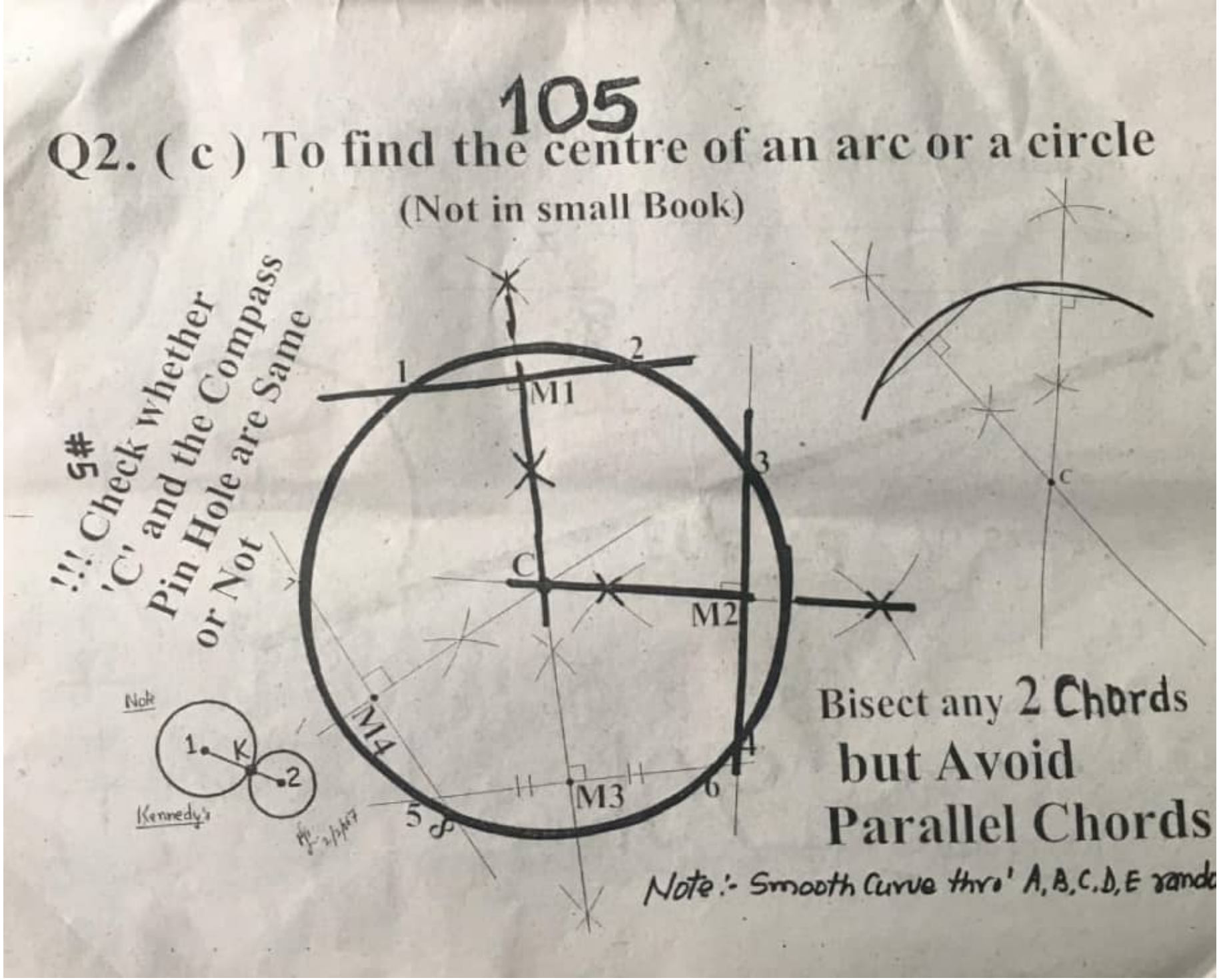


CamScanner

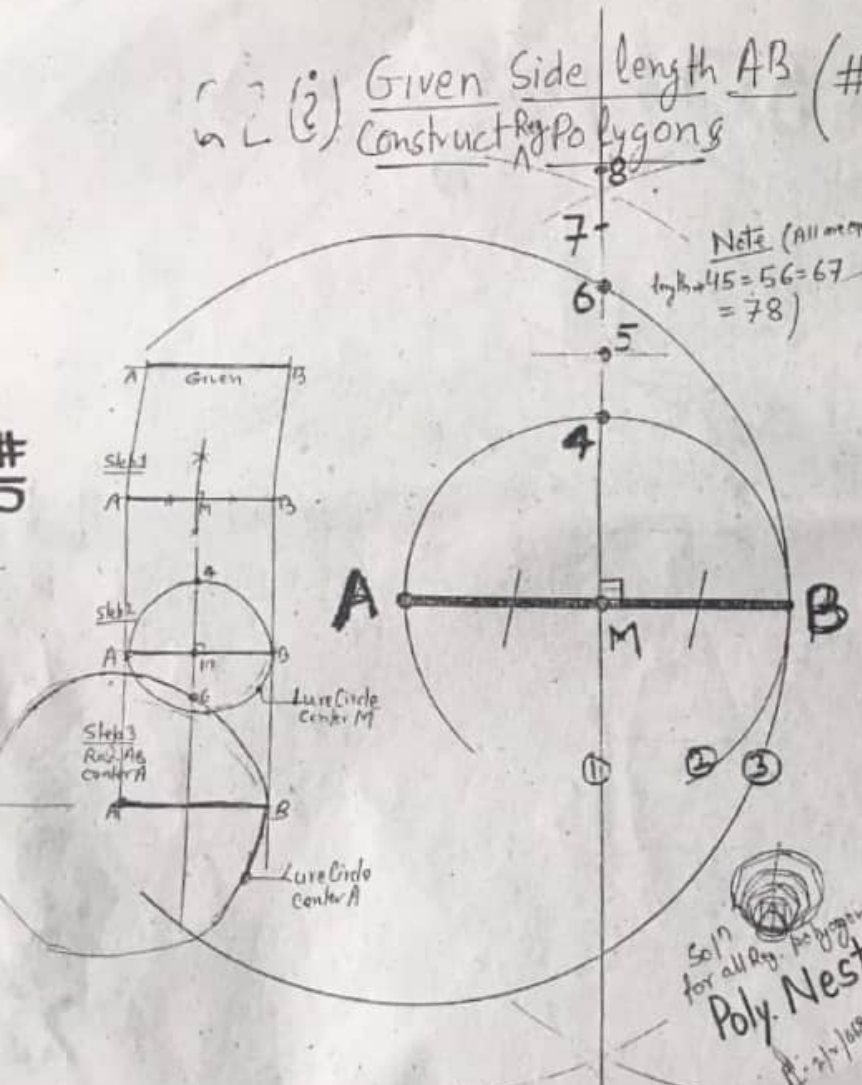
105

Q2. (c) To find the centre of an arc or a circle

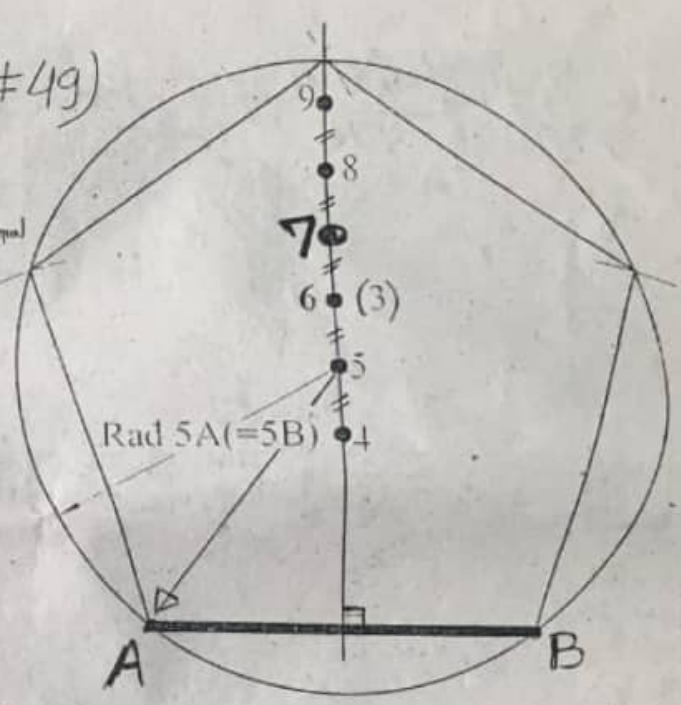
(Not in small Book)

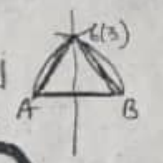


(2) Given Side length AB (#49)
Construct Reg Polygons



Note (All are equal)
length = 45 = 56 = 67 = 78)





Soln for all Reg. Polygon
Poly. Nest!!!
Ef. 21/1/13

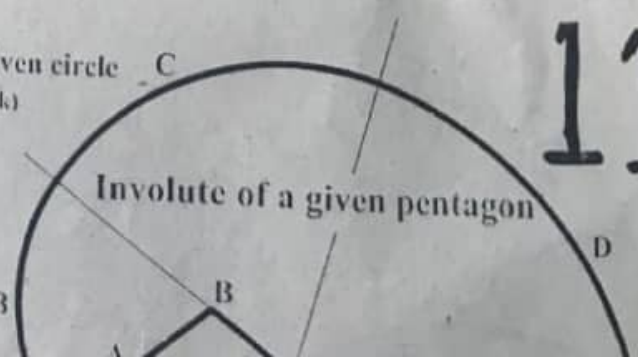
110

For Heptagon
take 7 as center &
7A (=7B) as radius
Cut 7 times by AB

Note - don't cut in 1 direction
make more than 1 starting

Q2. (j) Involute on a given circle
(# 67 in Small Book)

Involute of a given pentagon

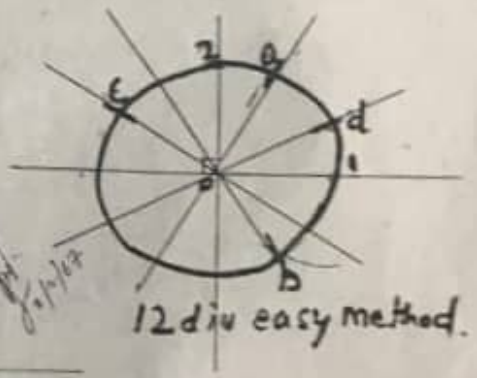


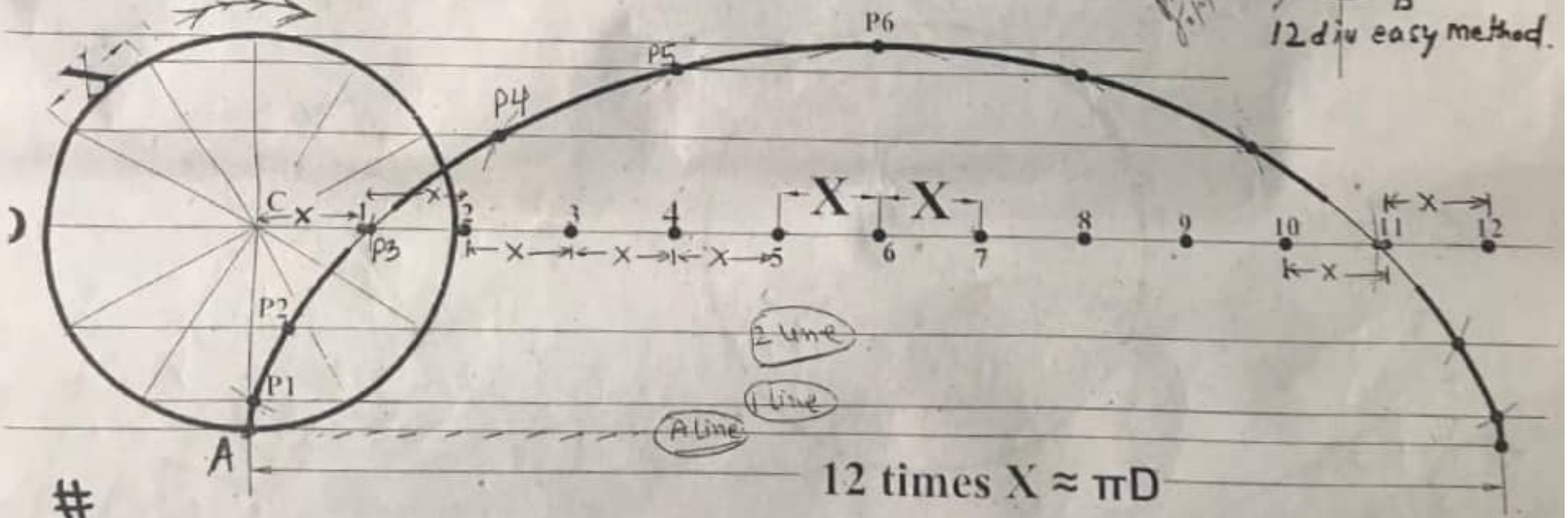
111

(113)

Q2. (I) Cycloid

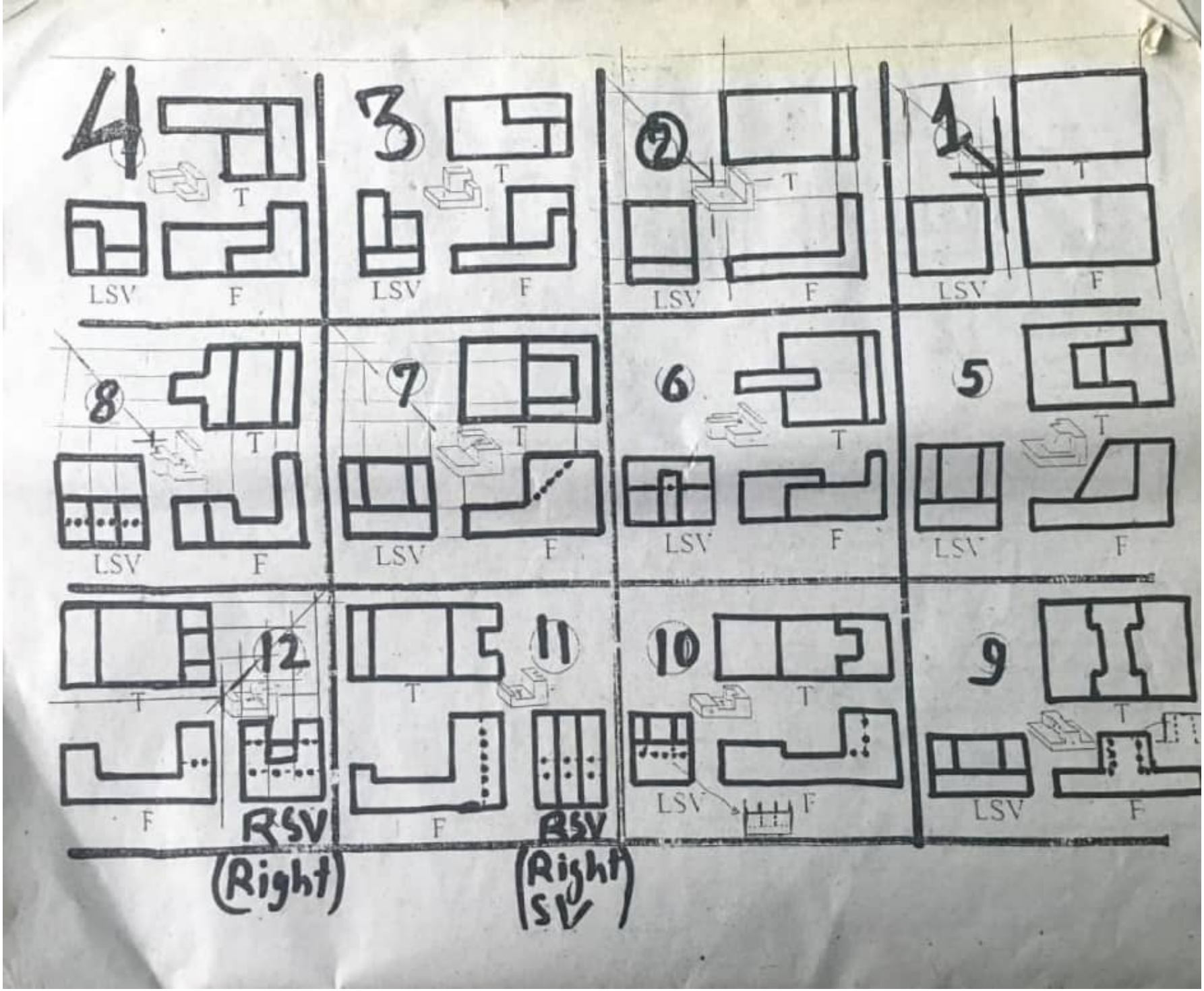
[# 64 in Small Book]

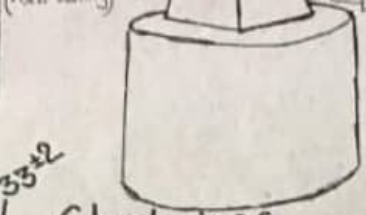




Free hand (or french Curve) at last

(13 #


4
T
LSV
F
3
T
LSV
F
2
T
LSV
F
1
T
LSV
F
8
T
LSV
F
7
T
LSV
F
6
T
LSV
F
5
T
LSV
F
12
T
F
RSV
(Right)
11
T
F
RSV
(Right SV)
10
T
LSV
F
9
T
LSV
F



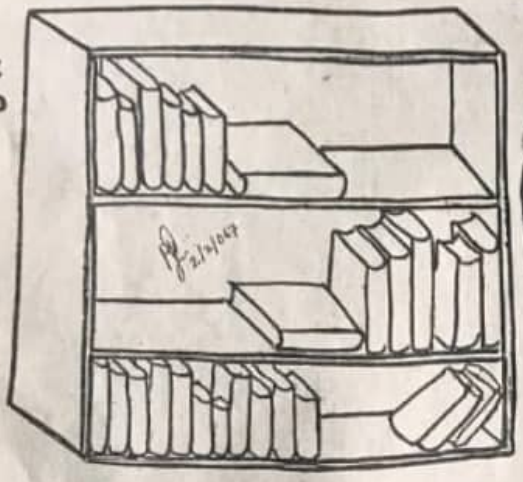
#33#2

Free Hand Sketches

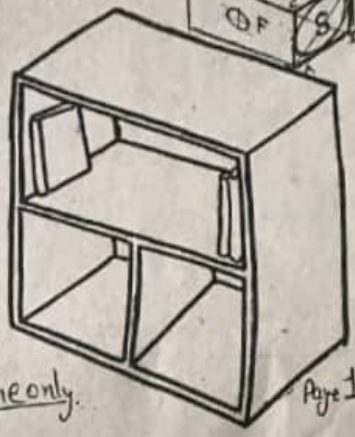
101

Q.No 1

All free hand work



#2



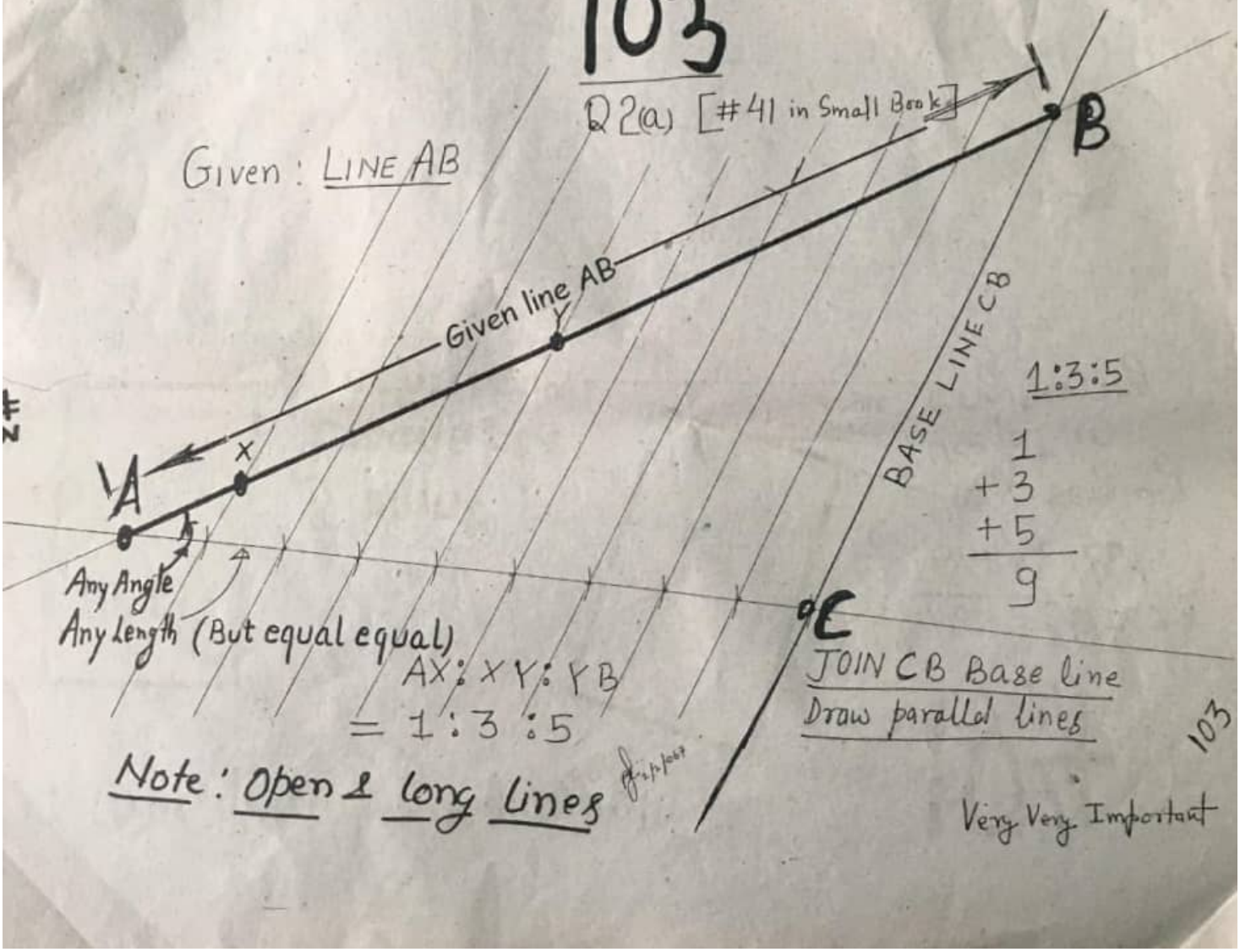
Don't Write Titles
It's wastage of time only.

Page 101

103

Q 2(a) [#41 in Small Book]

Given : LINE AB



1:3:5

1
+3
+5
9

JOIN CB Base line
Draw parallel lines

Note : Open 2 long lines

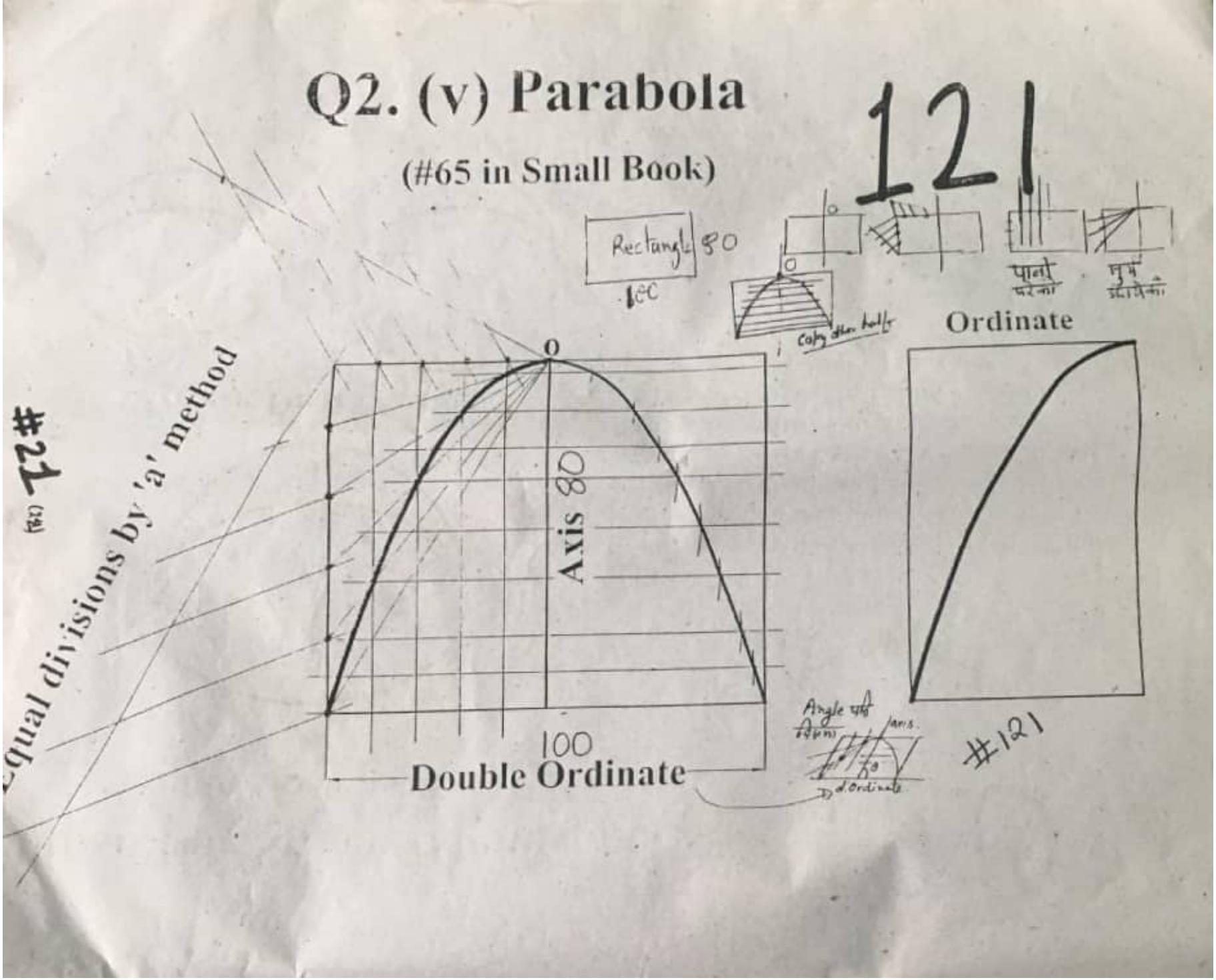
Very Very Important

103

Q2. (v) Parabola

(#65 in Small Book)

121



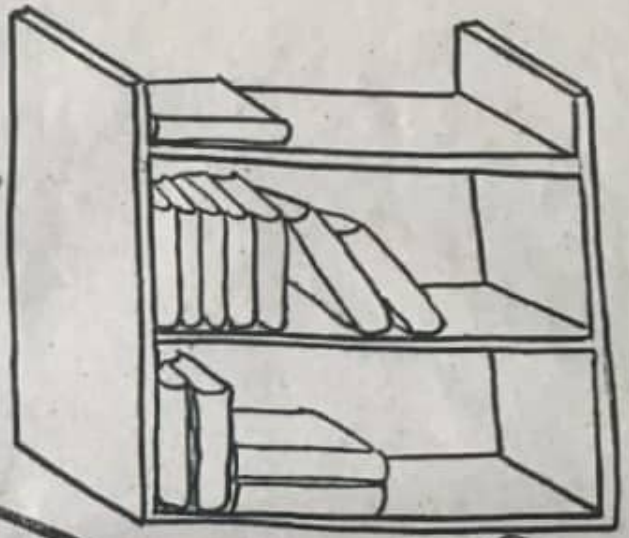
Q.No.1

FM-10

(Proportionality of Sizes.)
(•Best Looking)

??
Tetrahedron.
Hexahedron.
Frustum.
Truncated.

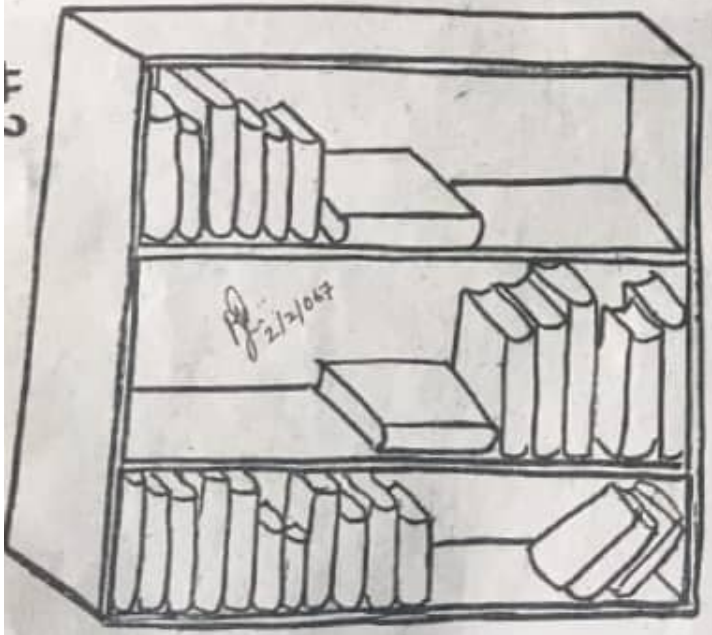
PATTERN
(2D बुद्धा)



Name:-
Details:-

#33±2

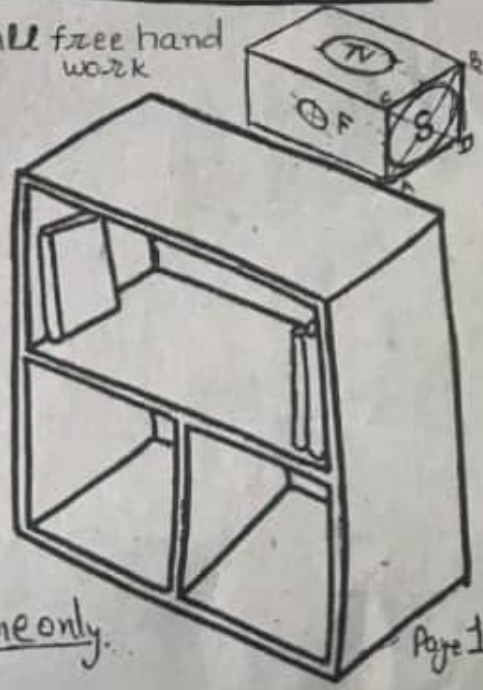
Free Hand Sketches



101

Q.No.1

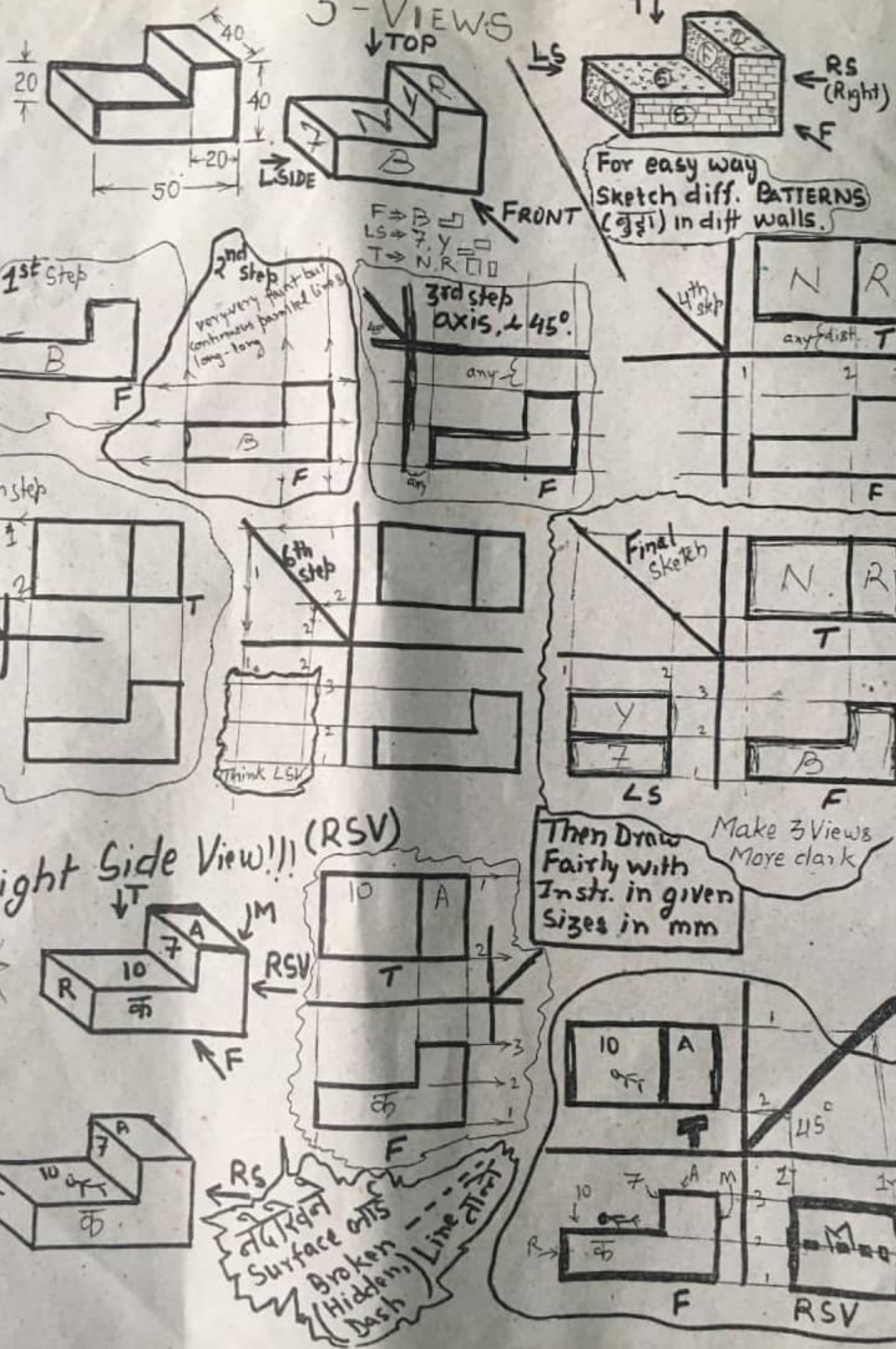
All free hand work



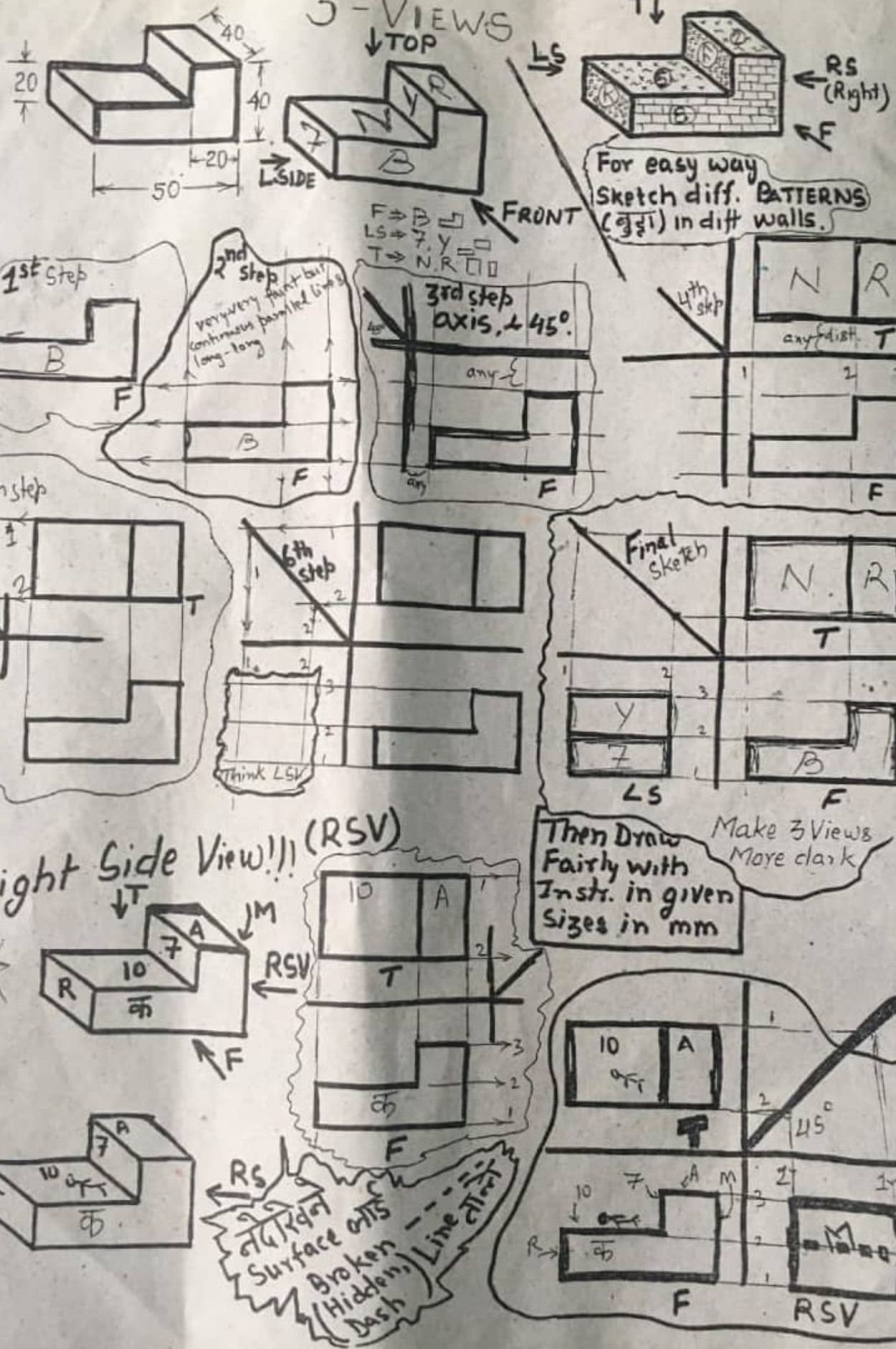
Don't Write Titles
It's Wastage of time only.

Page 101

3-VIEWS


TOP
FRONT
L.SIDE
LS
T
RS (Right)
F
For easy way Sketch diff. PATTERNS (पट्टी) in diff walls.
F ⇒ B
LS ⇒ Z, Y
T ⇒ N, R
1st Step
2nd step
very very short but continuous parallel lines long-long
3rd step
axis, ∠ 45°.
4th step
any dist.
5th step
6th step
Think LSV
Final Sketch
Then Draw Fairly with Instr. in given sizes in mm
Make 3 Views More clark
Right Side View!!! (RSV)
RSV
45°
RS
नदारखने Surface आई Broken (Hidden) Dash Line तोली

3-VIEWS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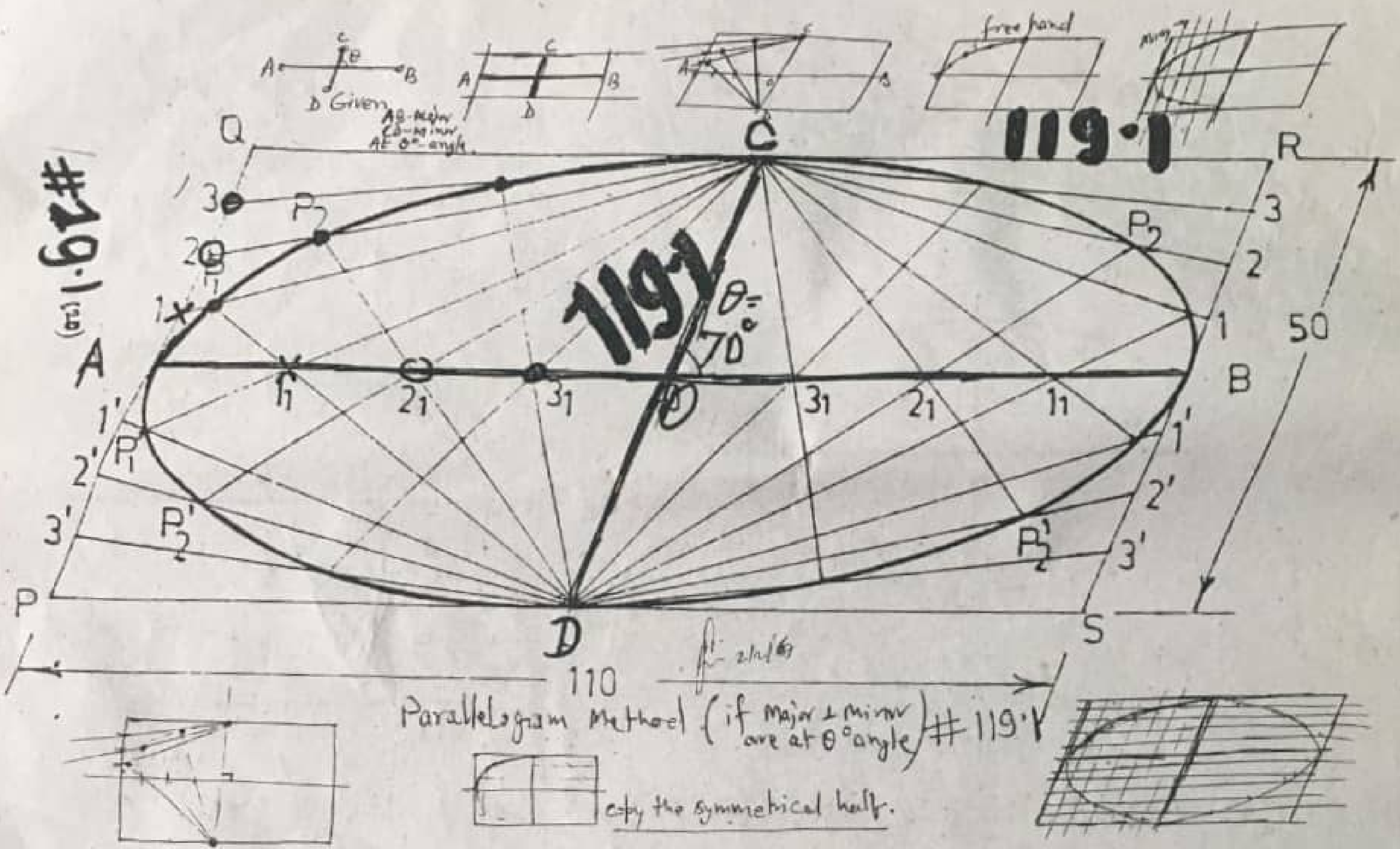


#119·1 (B)
119·1
119·1
Given AB-Major CD-Minor AE θ° angle
free hand
θ = 70°
110
50
Parallelogram Method (if Major & Minor are at θ° angle) #119·1
copy the symmetrical half.

Printing Stability Write Slow (विस्तार, ढिलो लेख

Lettering :-

Start Practice of freehand lettering, Separate, Repeatable, uniform & Single Stroke with few word only.
simple shake No over writing

Printing

SIZES

Max Height ↕ 10 mm

Min ↕ 6 (measured in Capital)

GUIDE LINES

Very very faint Guidelines with SCALE

2 very faint lines → TWO FOR CAPITAL

4 very faint lines → 4 for small, height =1 =2 =1 Ratio

Types

- VERTICAL — A B C D E . . . 1, 2
- UPPERCASE (OR CAPITAL OR BIG) — INCLINED (OR ITALICS) — A B C D . . 1, 2.
- θ = Max 75°
- vertical — a b c d . . 5, 6.
- lowercase (or small) letters — italics (or inclined) — a b c d . . 3, 4

Bank of all letters

a b c d e f g h i j k l m n o p q r s t u v w x y z,

7 / 8 ! " 9 ? 0" (REPEATABILITY & Uniformity) STABLE

Now start lettering with 'f light 747 landed'

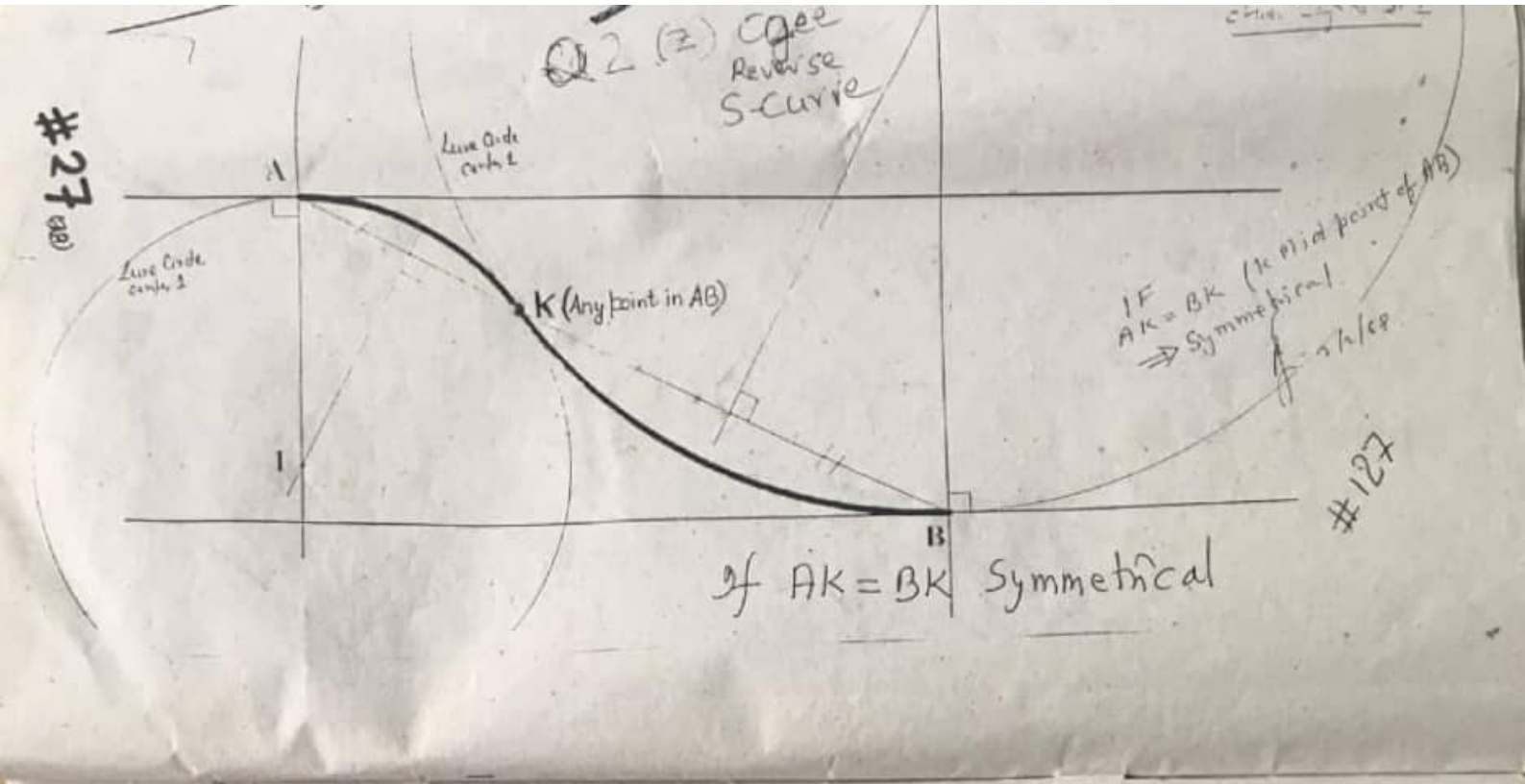
!! Don't begin with very long sentences!!!

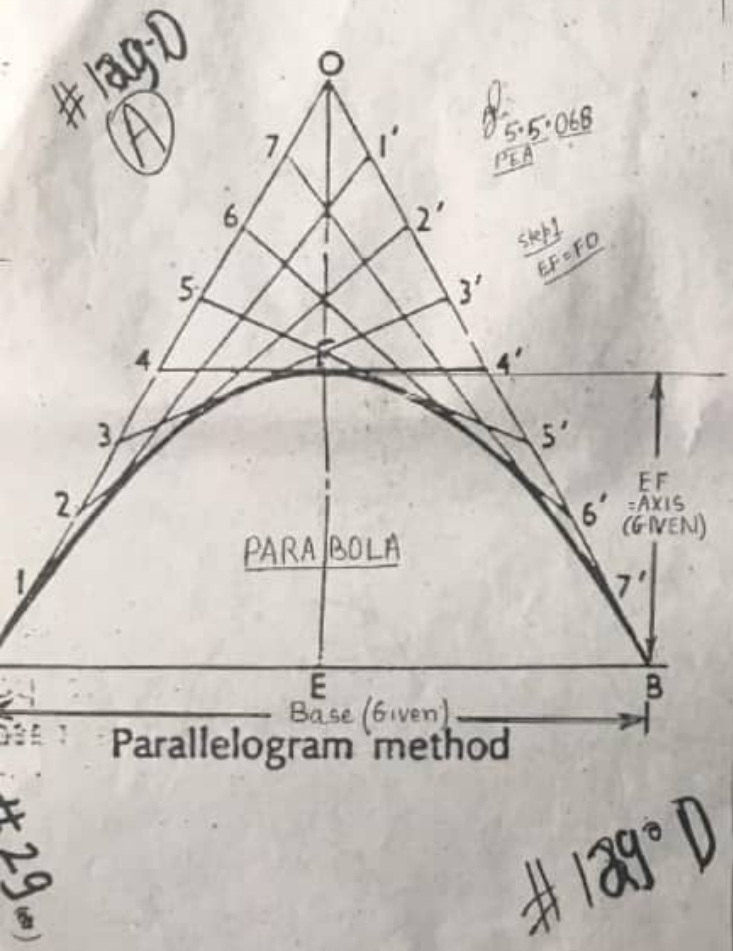
Slow - slow - Printing -
विस्तारै, ढिलो लेख्नु Guide line तानेर

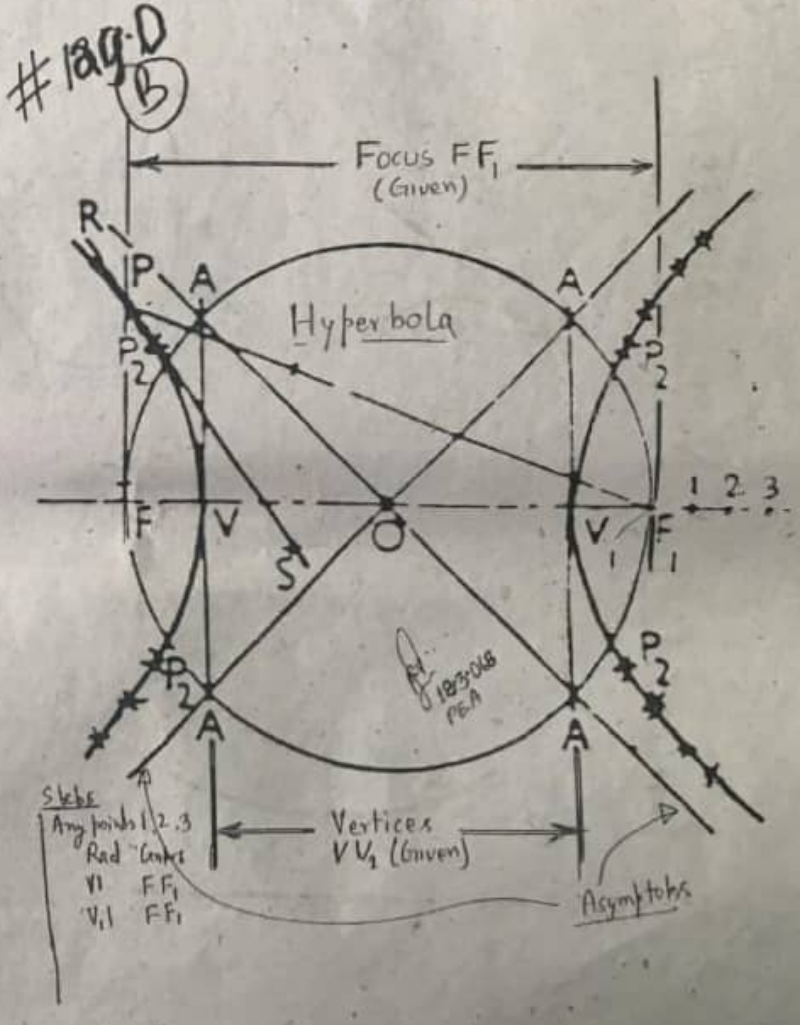
Signatures are Repeatable / Single stroke.

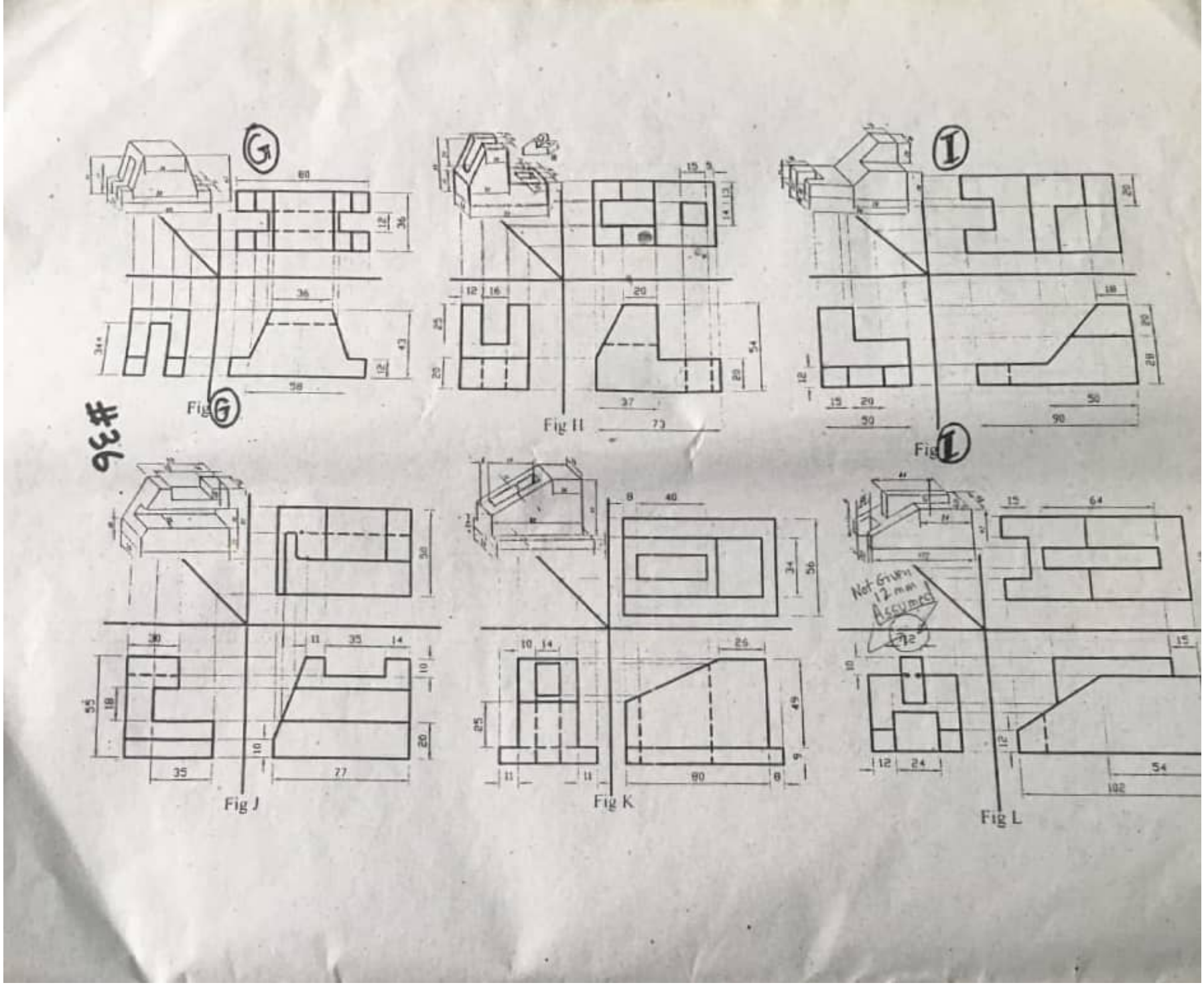
2/2/069

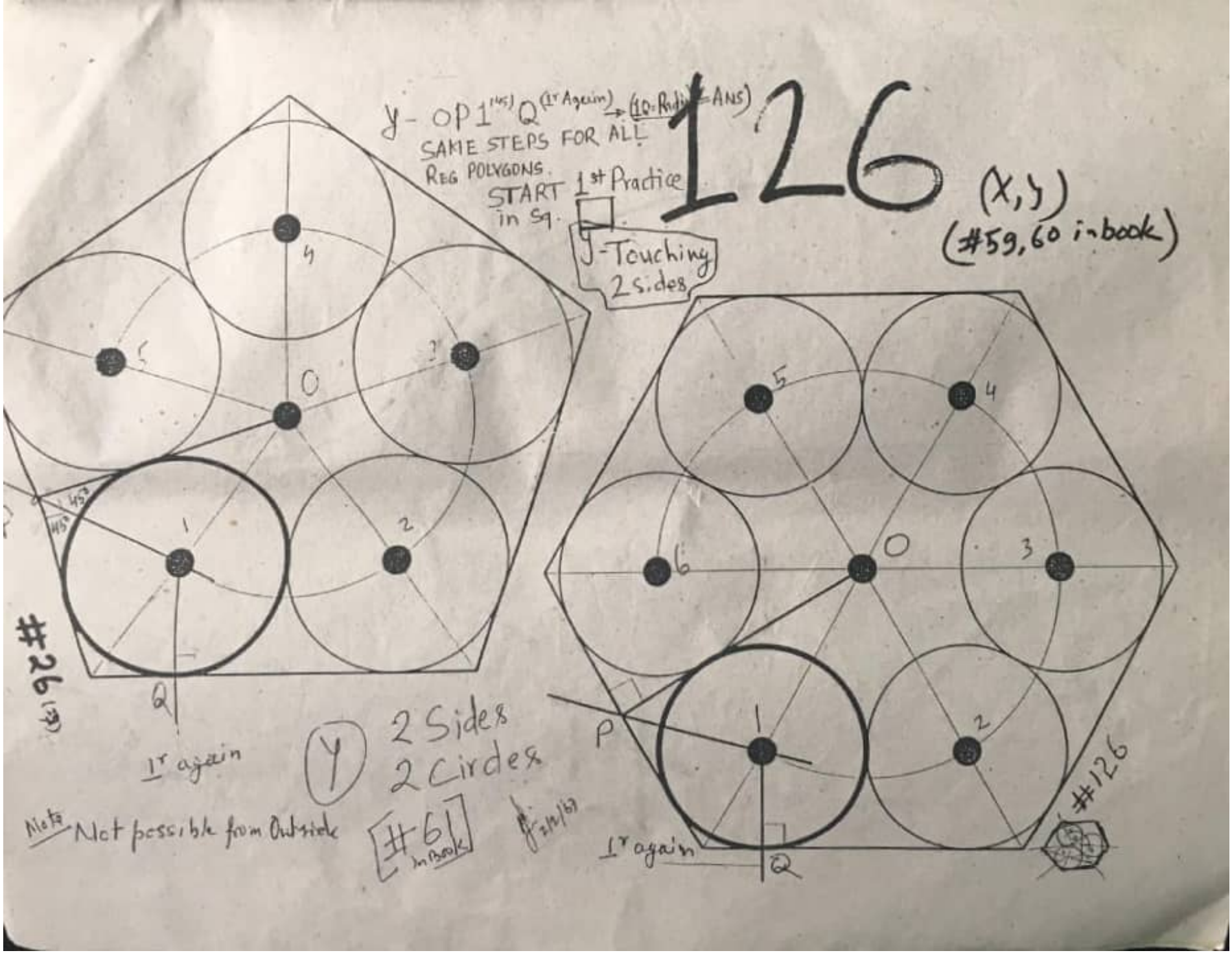
#1


Q2 (2) Ogee
Reverse
S-Curve
#27 (2B)
A
Locus Circle
centre 2
Locus Circle
centre 1
K (Any point in AB)
1
B
IF AK = BK (K is mid point of AB)
⇒ Symmetrical
#127
If AK = BK Symmetrical


#129·D
(A)
O
7
1'
6
2'
5
3'
4
4'
3
5'
2
6'
1
7'
EF
=AXIS
(GIVEN)
PARABOLA
E
B
Base (Given)
Parallelogram method
5·5·06B
PEA
Skpl
EF=FO
#129·D
#29 (2B)


#129·D
(B)
Focus FF1
(Given)
R
P
A
Hyperbola
P2
F
V
S
O
V1
F1
1 2 3
183·06B
PEA
Skebs
Any points 1 2 3
Rad Centrs
V1 F F1
V1 F F1
Vertices
VV1 (Given)
Asymptotes

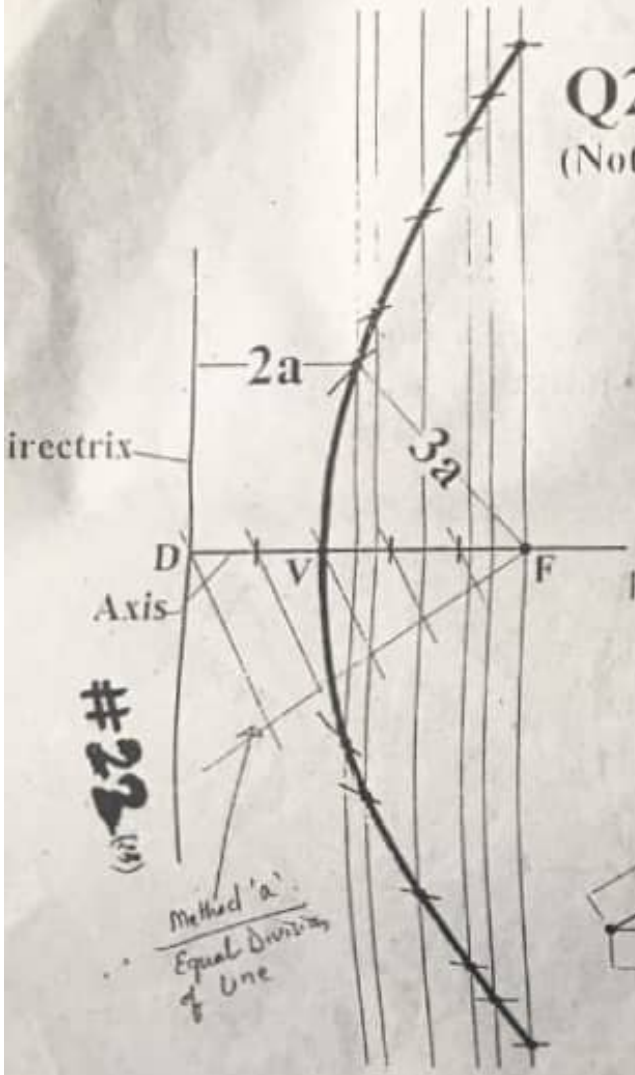

G
Fig G
Fig H
I
Fig I
#36
Fig J
Fig K
Not Given
12 mm
Assumed
Fig L


y - OP 1st Q (1st Again) → (No Radius = ANS)
SAME STEPS FOR ALL
REG POLYGONS.
START 1st Practice
in Sq.
126
(X, Y)
(#59, 60 in book)
y - Touching
2 sides
#26(a)
Q
1st again
(Y)
2 Sides
2 Circles
Note Not possible from Outside
[#6 in Book]
#126
P
1st again
Q

12'L

Q2. (w) Hyperbola

(Not clear in #65 of Small Book)

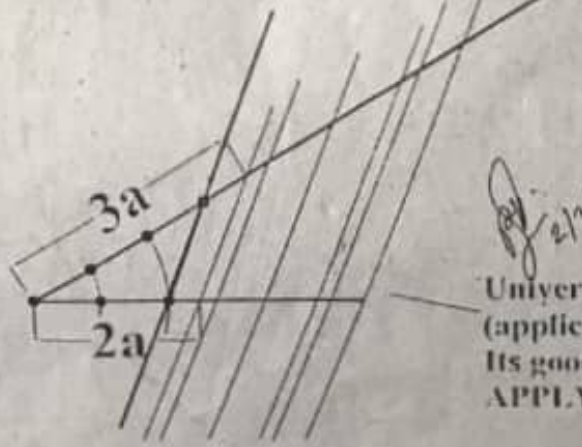


Note! D & D

Given:
DF= 100

$e = \frac{3}{2} = \frac{\text{Dist. from Focus}}{\text{Dist from Directrix}}$

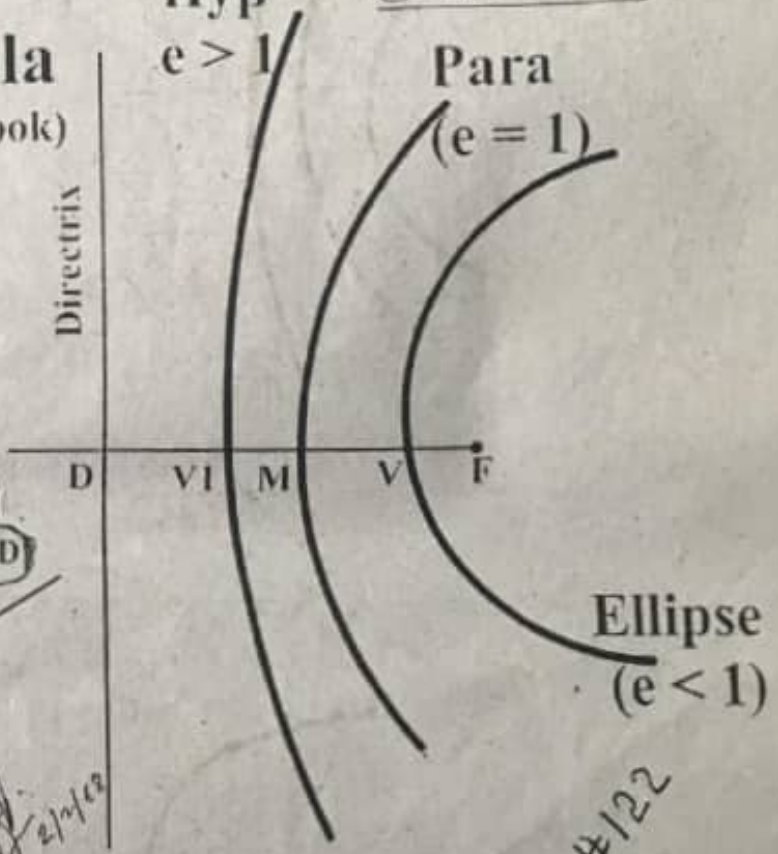
Denominator → Directrix; D & D



Universal Tool for ratio conversion
(application of 'a' method)
Its good to KNOW &UNDERSTAND &
APPLY this concept

Method 'a'
Equal Divisions of One

Conic Curves



#122

#122(w)

(e) To find the straight length of an Arc

107

(Not in Small Book) For exact Q Ref QB Vol2 #472

Steps

1- C

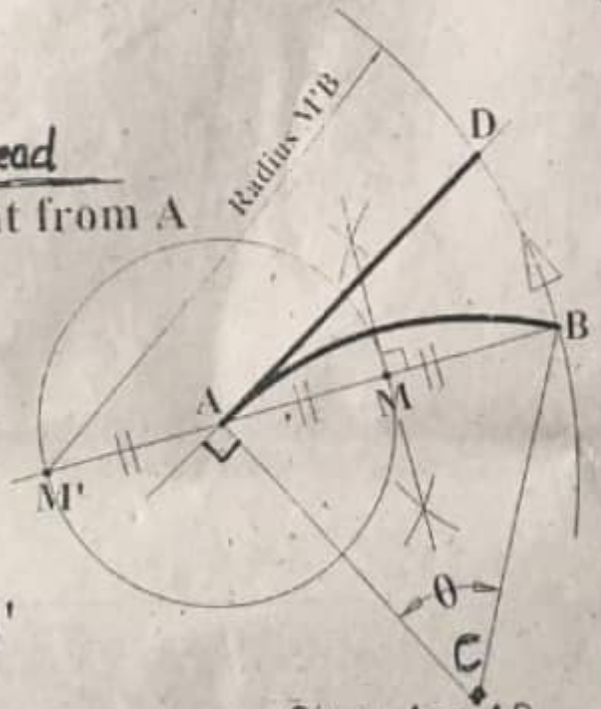
2- $\theta \leq 60°$, Go ahead

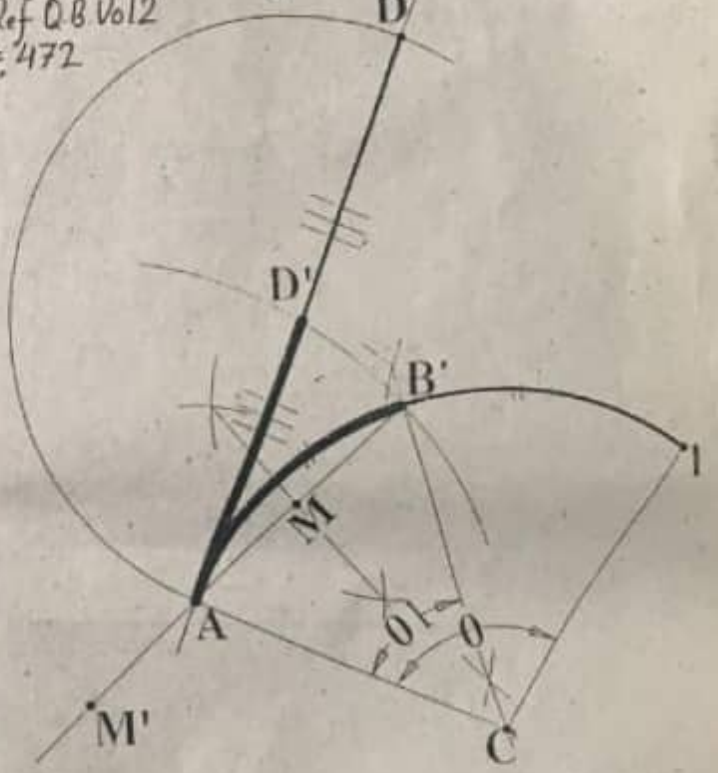
3- $\perp$ AC, Tangent from A

4- AB Line

5- M

6- M'





LAST STEP,

7, Center M'

Radius M'B

AD is the Answer

M'D is NOT the Answer

(e) Given Arc AB
For Questn-Ref
QB Vol-2 #472

$\theta_1 = \theta/2 \leq 60°$

$\theta \leq 60°$

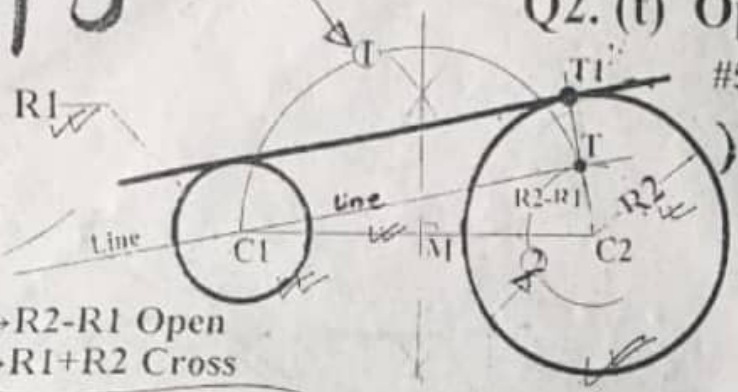
For Exact Quest See #472 QB Vol2

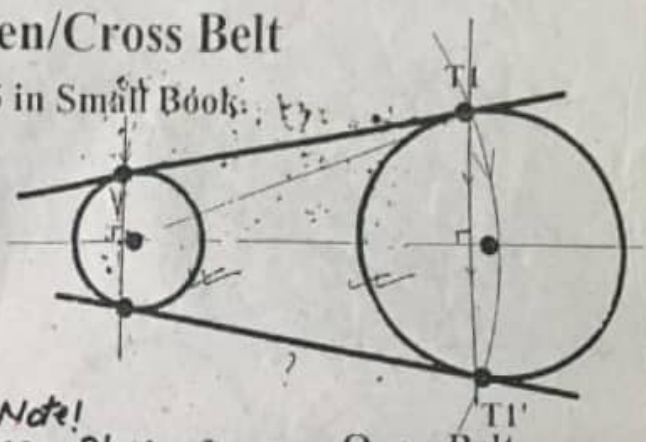
If $\theta >> 60°$, half, half, half until you get $\leq 60°$, then double, double, double the answer. #107

118

Q2. (t) Open/Cross Belt

#55 in Small Book





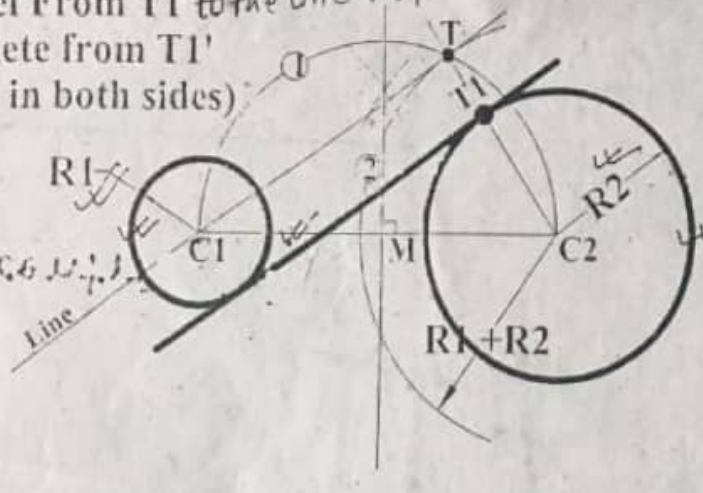
Open Belt

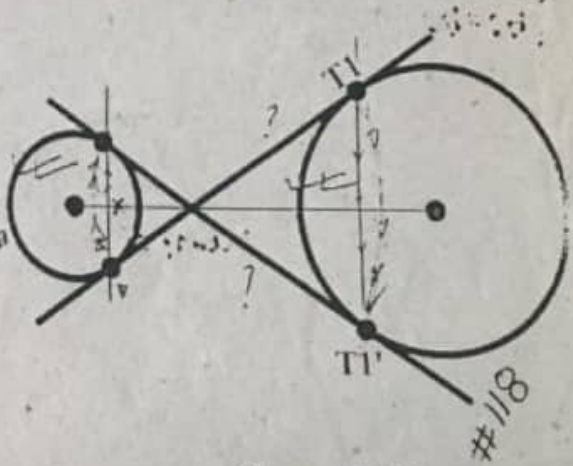
Steps

1- ①
2- ② →R2-R1 Open
→R1+R2 Cross
3- T
4- TC1 --Line
TC2--T1
5- Parallel From T1 to the line TC1
6- Complete from T1'
(Copy in both sides)

Note!
PLUSSS-CROSS-PLUS-Cresss

Copy in both Sides





#118

Cross Belt

119

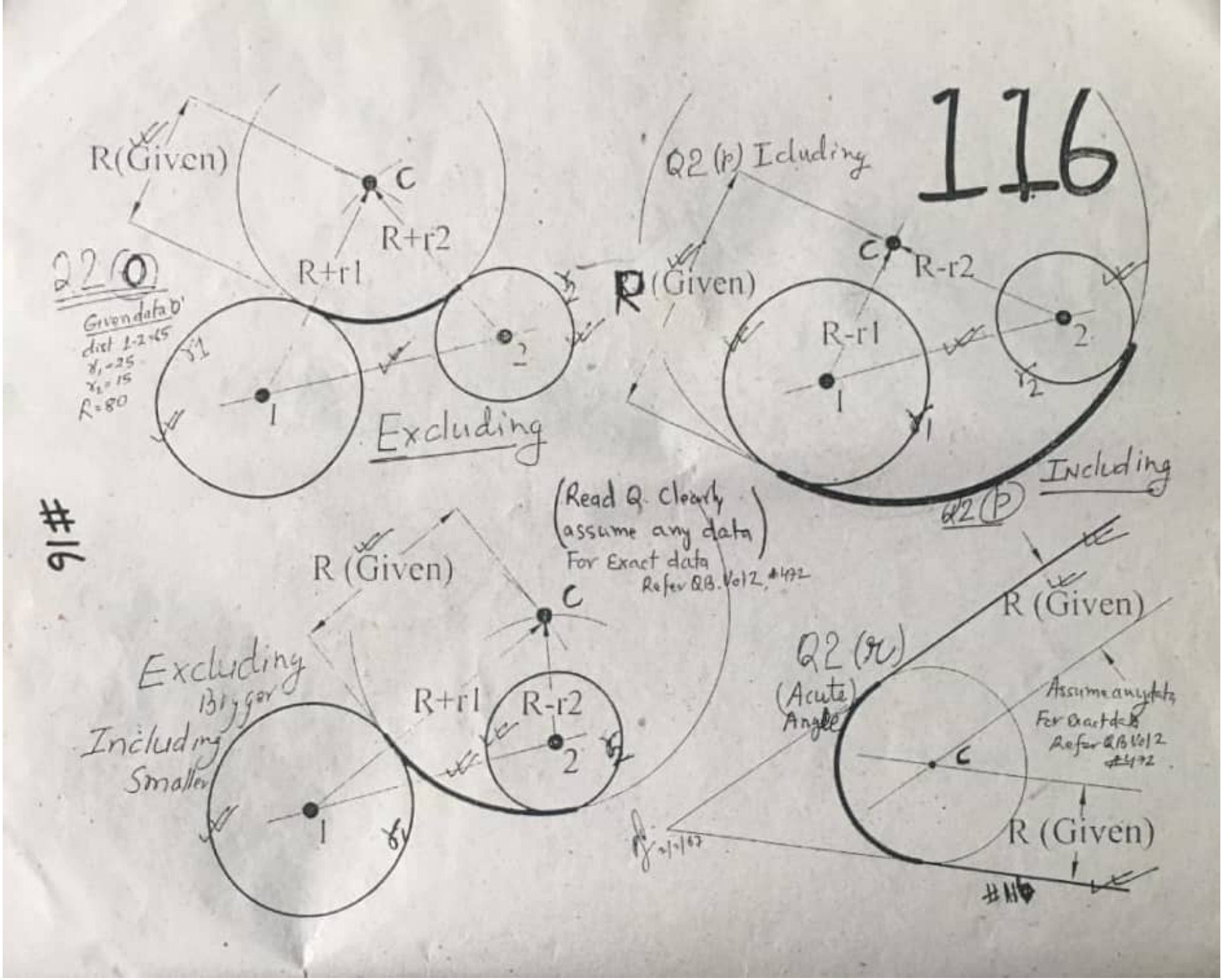
Q2. (u) Ellipse

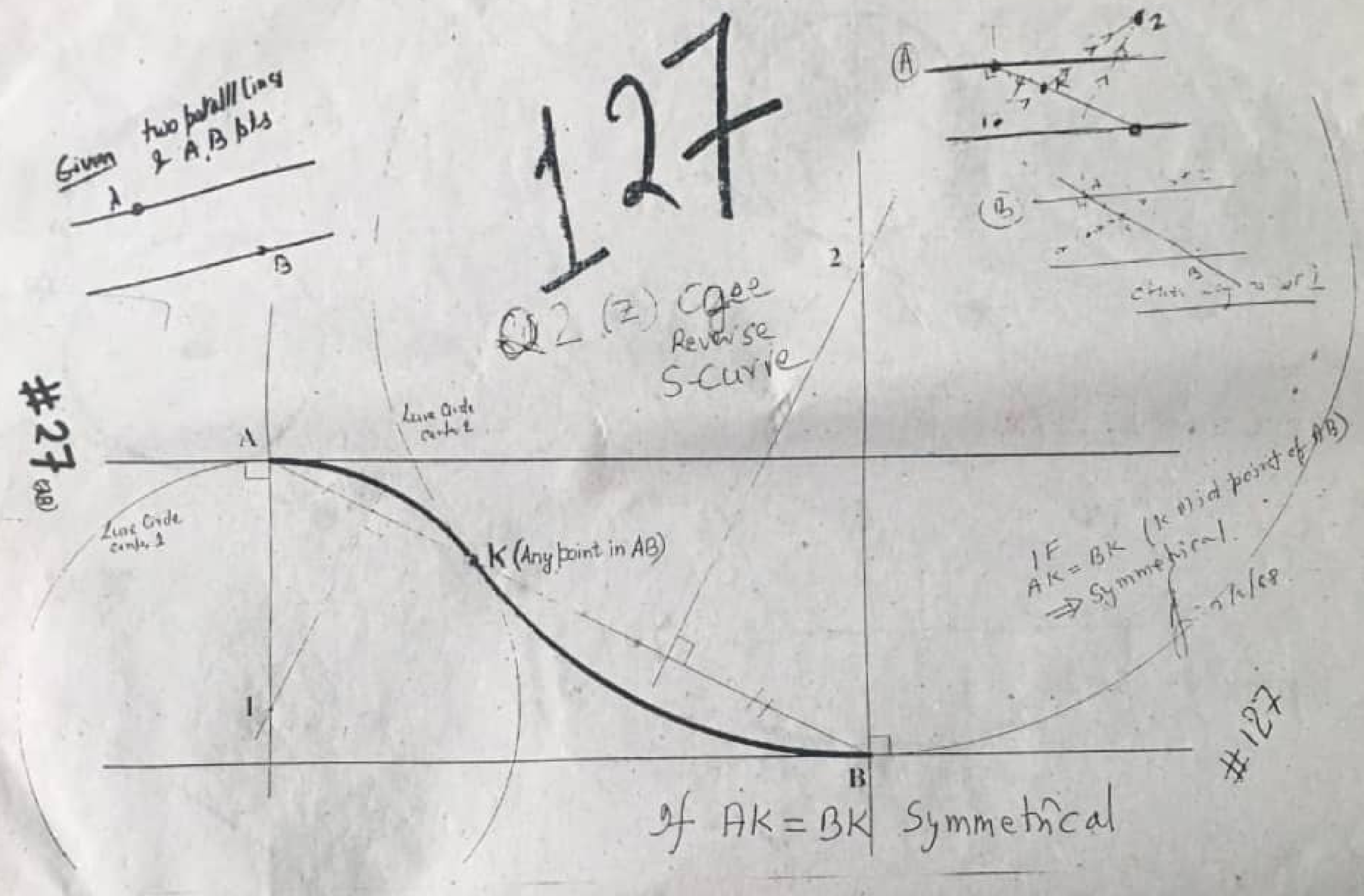
(#64 in small Book)

Concentric Circle

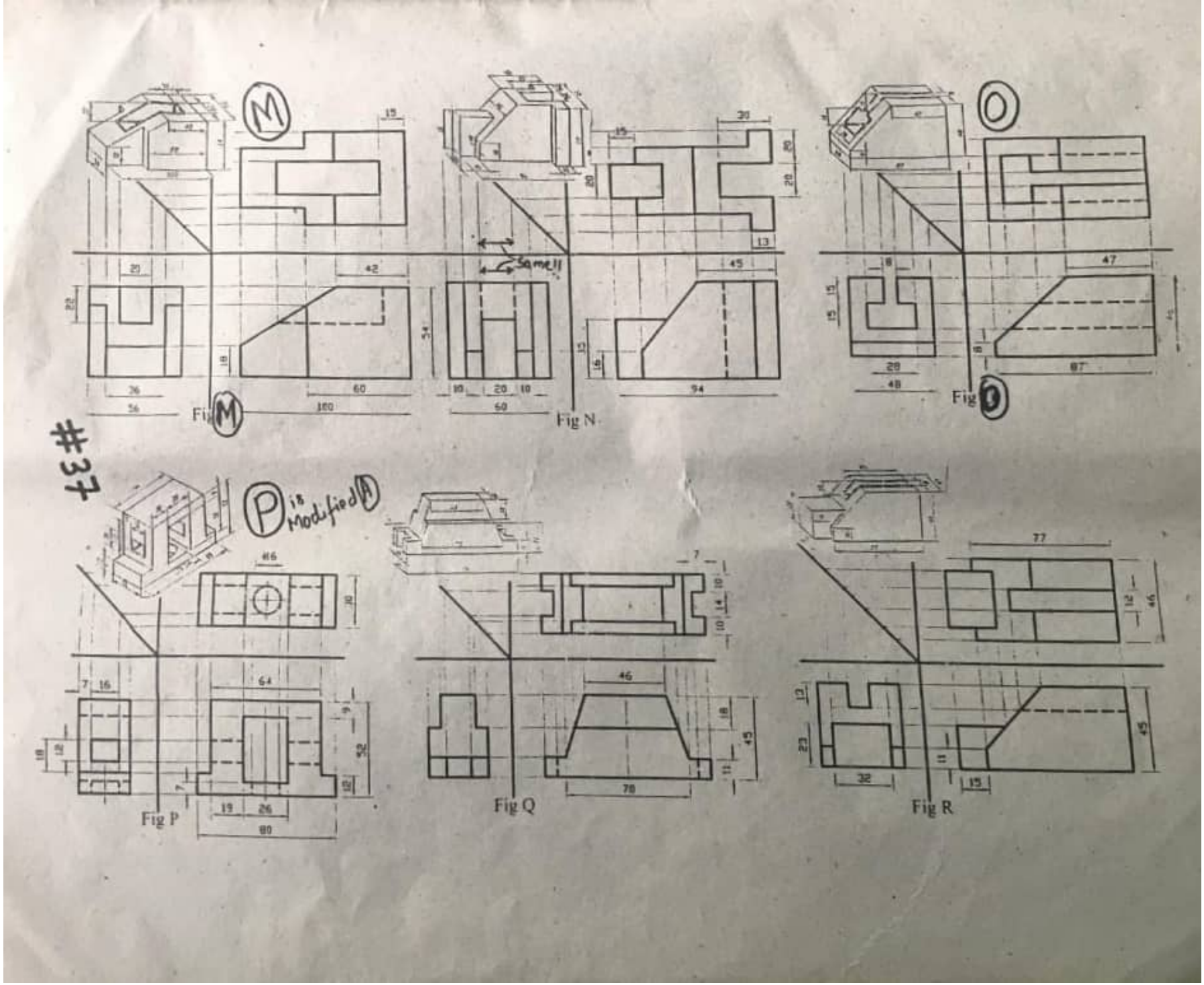
Q2(u)Ellipse: Four center Method

(#63 in small Book)


116
R(Given)
C
R+r2
R+r1
1
2
Excluding
Q2 (P) Including
R (Given)
C
R-r2
R-r1
1
2
Including
Q2 (P)
91#
(Read Q. clearly
assume any data)
For Exact data
Refer QB. Vol 2, #492
R (Given)
C
Excluding
Bigger
Including
Smaller
R+r1
R-r2
1
2
Q2 (R)
(Acute)
Angle
R (Given)
Assume any data
For Exact data
Refer QB Vol 2
#492
C
R (Given)
#116

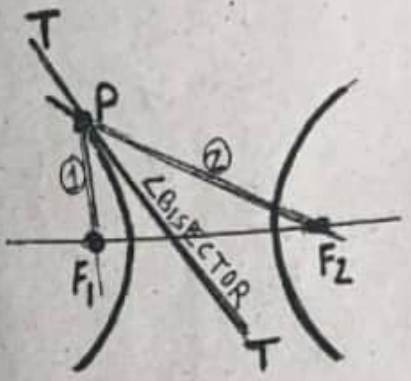

127
Q2 (Z) Cgee
Reverse
S-Curve
Given two parallel lines
& A, B pts
A
B
#27
Luse Circle centre 2
Luse Circle centre 1
A
K (Any point in AB)
1
2
B
If AK = BK Symmetrical
IF
AK = BK (K Mid point of AB)
⇒ Symmetrical.
#127
A
B

CamScanner

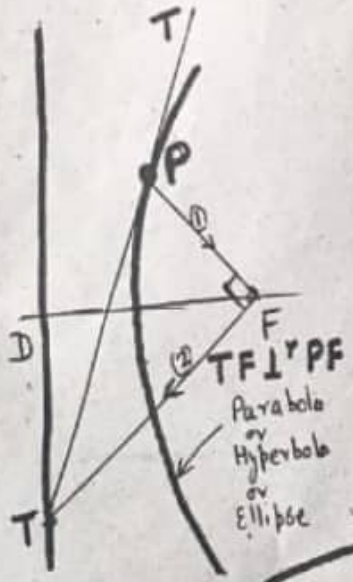

M
Same
Fig M
Fig N
O
Fig O
#37
P is modified
Fig P
Fig Q
Fig R

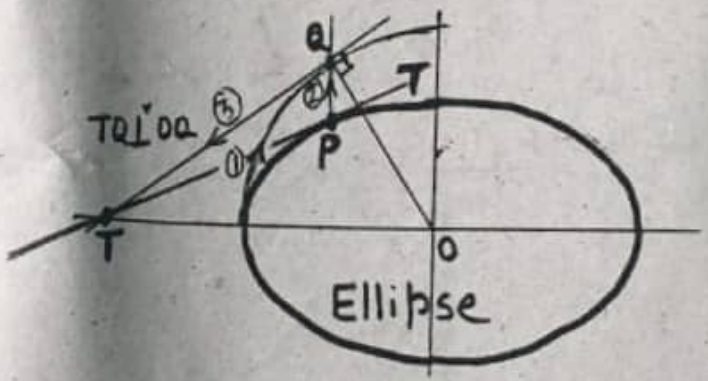
129·1

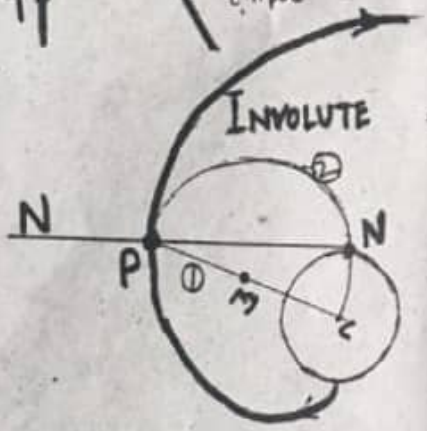
TANGENT (TT) $\perp^r$ NORMAL (NN) at POINT 'P'

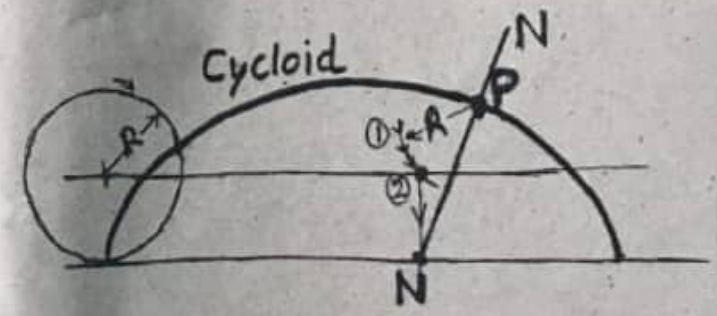


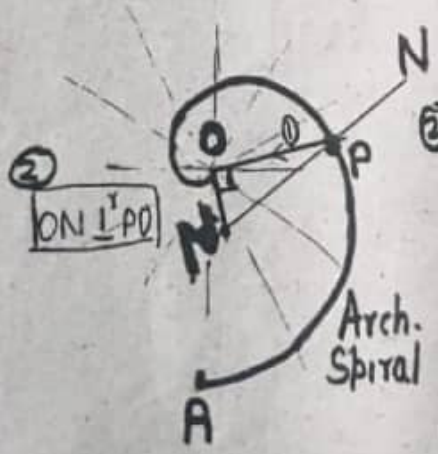
Hyperbola.





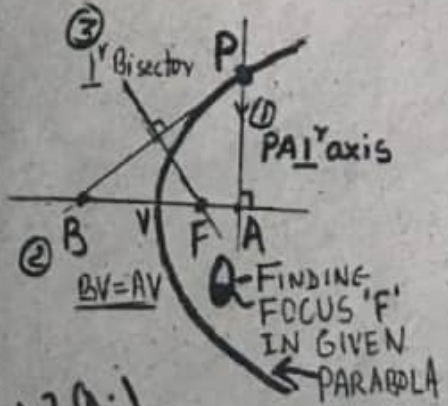






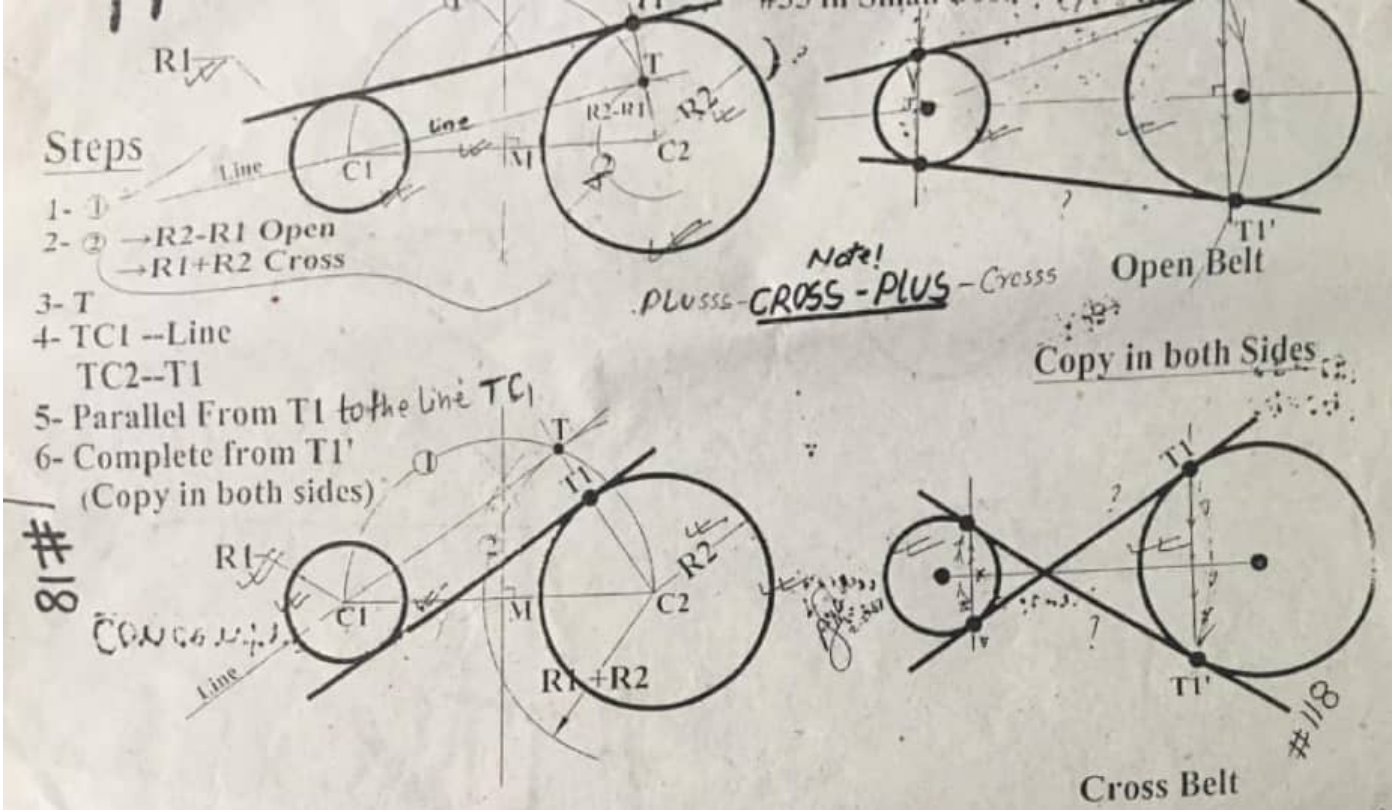
② $ON = \frac{OA}{2\lambda}$

(Condt.)



#30

129·1



Steps

1- ①
2- ② →R2-R1 Open
→R1+R2 Cross
3- T
4- TC1 --Line
TC2--T1
5- Parallel From T1 to the line TC1
6- Complete from T1'
(Copy in both sides)

Note!
Plusss-CROSS-PLUS-Crosss

Open Belt

Copy in both Sides

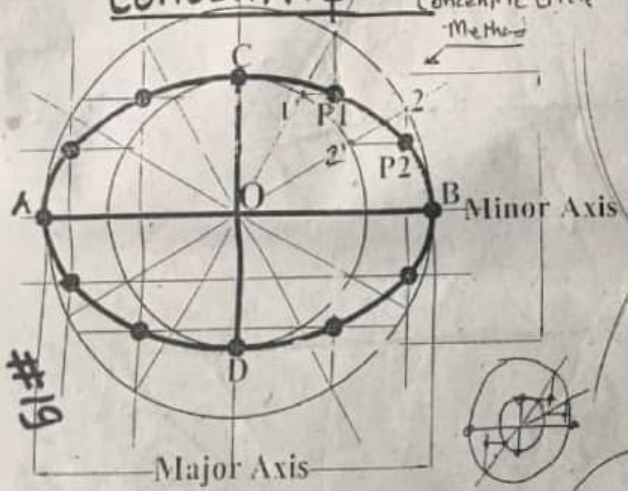
Cross Belt

119

Q2. (u) Ellipse

(#64 in small Book)

Concentric Circle



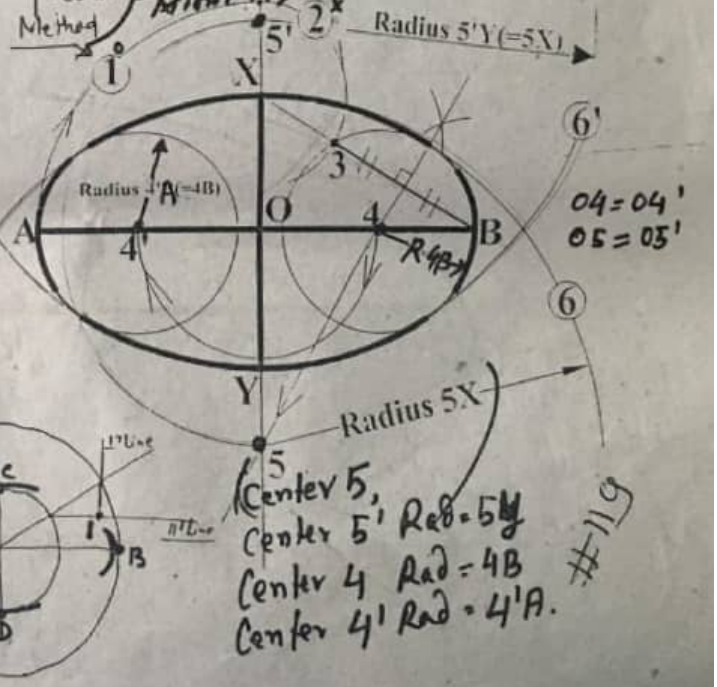
Smoothly join all intersection points of horizontal line from smaller and vertical line from bigger circle points (Free hand work necessary)

Q2(u)Ellipse: Four center Method

(#63 in small Book)

4-Centre Method

Major AB → Given.
Minor XY



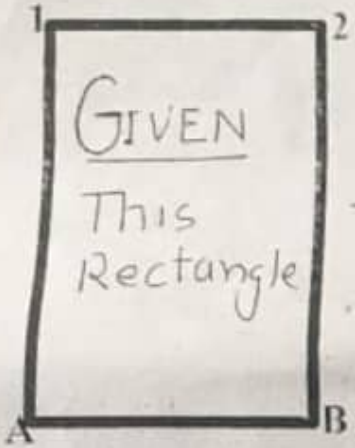
Center 5, Rad=5Y
Center 5' Rad=5'X
Center 4 Rad=4B
Center 4' Rad=4'A.

#38
80 More Practice Q's for Better
'Concept Building' in 3 Views.
- Show the ans's in Free hand sketch.
#38

Q2. (b) Copying a Rectangle

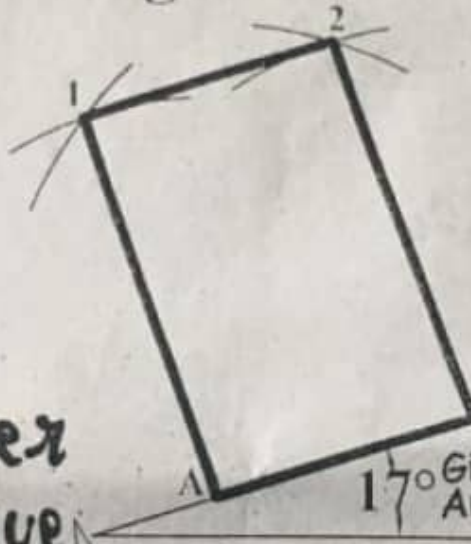
(Not in Samll book)

104



Copy

3 point transfer technique



Note :- 3pt. tr. tech. Simple but very-very-very useful in engineering.

(Make this Rectangle by any method)

123

DV=VF
e=1

Directrix

a

2a

D

V

F

Axis

DV is more
EF is less
e<1

Directrix

5a

2a

D

F

Axis

$e = \frac{2}{5} = \frac{\text{Dist. from Focus}}{\text{Dist from Directrix}}$

[Denominator → Directrix; D & D]

Q2. (w) Ellipse
(Given: e & DF)

When Eccentricity Given

5a

2a

Q2. (w) Parabola
(Not clear in #65 of Small Book)

Not Reqd

Hyp
e > 1

Para
(e = 1)

Directrix

D

V1

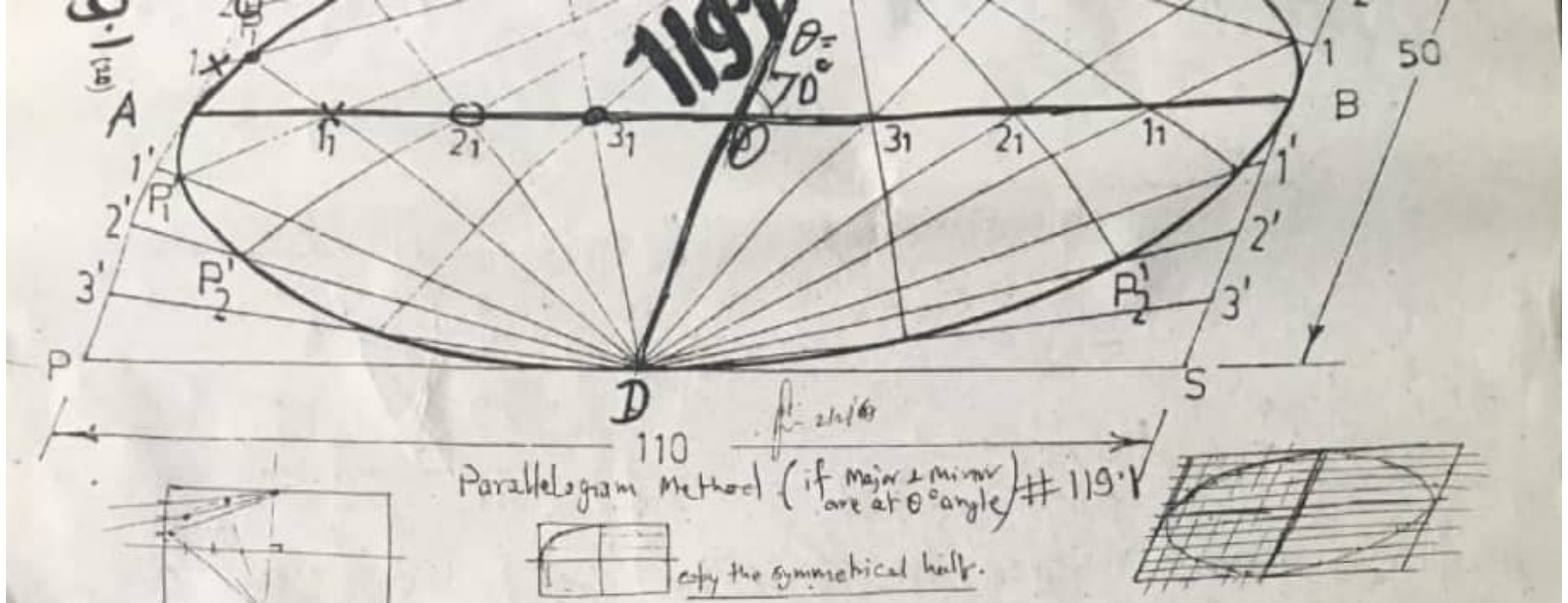
M

V

F

Ellipse
(e < 1)

#123



Parallelogram Method (if major & minor are at θ° angle) #119

copy the symmetrical half.

Ellipse: For Sphere/Hemisphere

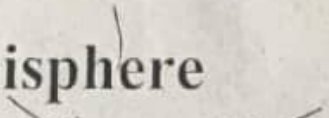
120

(Not in Small Book)

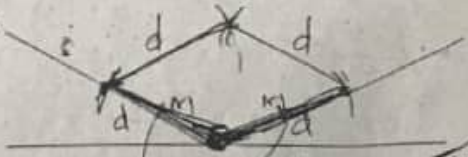
ISOMETRIC VIEW OF

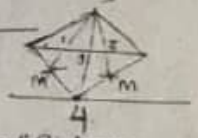
#20 Dia

Given: Dia of Sphere



Diameter 'd' is given.

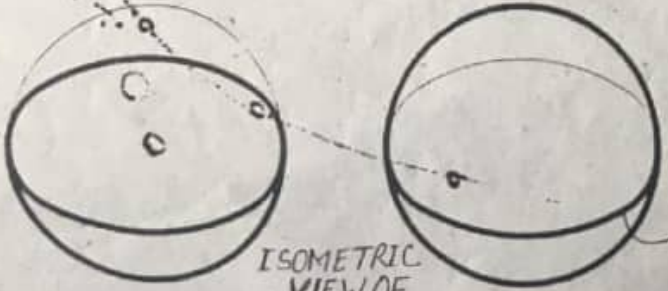




STEPS

1) 30° rombus with sides as given Dia. of Sphere
2) M and M' are mid-points of Sides of Rombus (Find O, then 1 and 3)
3) Draw arcs with center 1 & 3 and rad 1M
4) Draw arcs with center 2 & 4 and rad 2M
5) Draw circle/semicircle with center O and major radius of ellipse (=OZ)

#120



ISOMETRIC VIEW OF

Hemi-Sphere ↔ Sphere

Half only

C

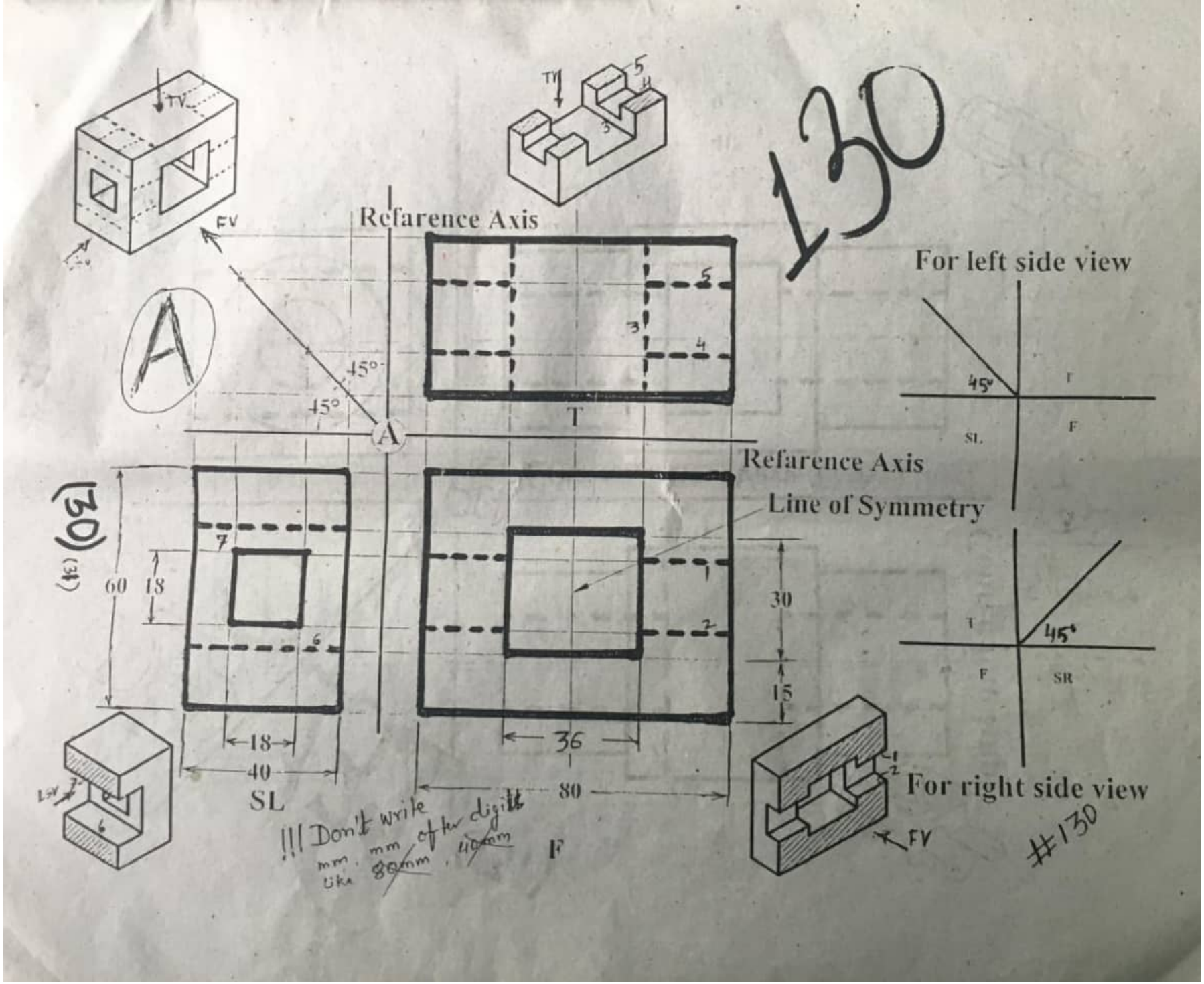
Note :- Final Diameter won't come true

#120

Apply for making Cone/Cylinder also Given dia & height

Cone

2/2/018


TV
FV
TV
Refarence Axis
45°
45°
A
T
Refarence Axis
Line of Symmetry
60
18
30
15
18
40
36
80
SL
F
FV
For left side view
45°
T
SL
F
T
45°
F
SR
For right side view
130
(130)
!!! Don't write mm. mm after digit like 80mm, 40mm
#130

Drawing O'ooopppp's — Drawing O'ooopppp's — O'ooopppp's of Drawing

1. What is the most important point for this question while copy correction or checking? [Proportionality of sizes]

2. What other important things? [no use of instruments (should be purely freehand sketch), no broken (hidden) lines, very stable position, no use of colors, Best looking]

Q1 Freehand-Sketch [F Mark 10]

3. Can shading or multi-stroke pencil work or other decorative works be done? [Yes, but take care of total time taken]

#33±2

4. Can outer box or outline or border or the frame be made by instruments? [Anyway is correct]

2068

5. What is 'Patterns' in Nepali? [Butta in a plain paper (2 D Butta)]

6. When, where, how much time ? [Start with this Q, never on Front Or last page, finish within 15 min (or MAXIMUM 15 Min) + Left out time at the END]

7. Who gets full mark? [It's a relative performance, so try to do Best among all.]

Q3 Lettering- (Printing) [F Mark 5]

a. How many guidelines? [2 for uppercase & 4 for lowercase, middle portion is double]

1:2:1

b. Faint or Dark? The guidelines should be very faint with instrument & letters should be single stroke, freehand, separate, uniform dark.

slow slow fast slow

c. What is the most important point for this question while copy correction or checking? [Repeatability and uniformity]

d. Sizes? [Height of letter approx 10 to 12 mm & for inclined Max 75°]

e. Single stroke ? [Yes, all letters single stroke, Separate BUT no over-writing]

f. Only four types? YES →

g. 1.VERTICAL CAPITAL (UPPER CASE OR BIG) LETTERS- FENNGG
2.INCLINED (ITALICS) UPPER CASE (CAPITAL OR BIG) LETTERS- FENNGG

h. 3. vertical small (lower case) letters - fnngg
4. inclined (italics) lower case (small) letter s- fnngg

i. Simple type- never like this → Drawing O'ooopppp's

j. Digits 0-9, never in lower case

k. Don't change style r/r, a/a, g/g. - Maintain Repeatability & Stability

l. Practice or measurements first? [Practice, achieve these standards by practice and then only measure somewhere to be sure]

m. Don't join letters: Separation betn letter to letter & word to word should be uniform & repeatable

n. No need to complete in one line. In incomplete word hyphen or dash '-' is optional

o. Lecture or Practice first? [Practice first & then, if something wrong follow the lecture]

p. No opposite inclination- leaned forward only, no diagonally inclined.

q. Do this after Q1, after the page of Q1, in ABOUT 15 min time.

r. no english rules- no first letter uppercase if asked lower case, no spelling/ grammer / sentence-meaning correction.

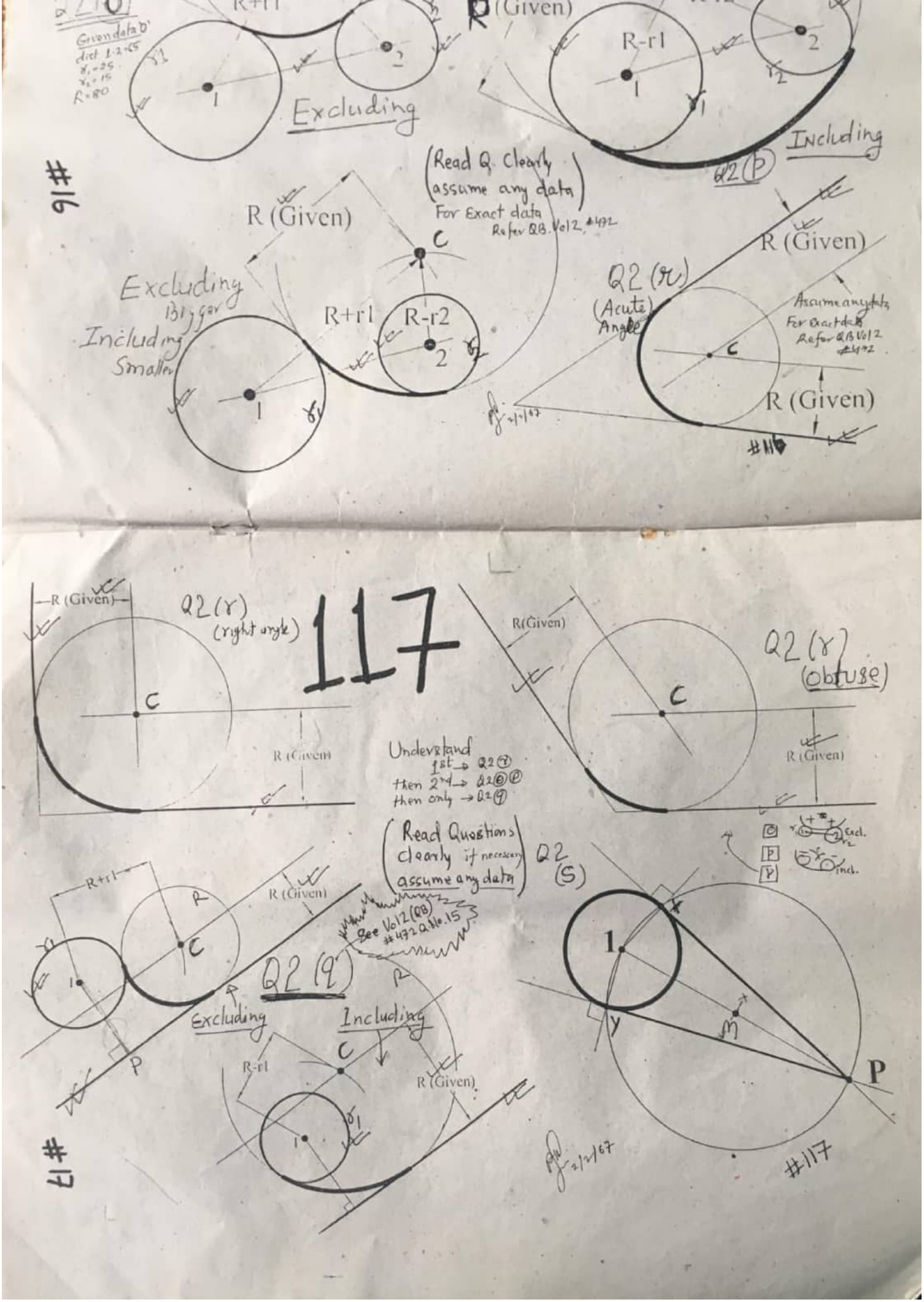
s. If confused about:- "_", ? / ( ) ! % ' ; refer any standard printed matters or books of Phy, Chem, Eng, Maths, etc.

t. Who gets full mark? [Also relative performance, so. . . do best . . .]

5 & 20 very very very Imp Imp.

Q4 VIEWS [FM15]- **Instruments**:- big set squares, scale & 2 compasses [write names, modify protractor to make tangents, put tapes for easy holding, keep in safe bag]; always use blank white paper for practice [no need of border line, title box]. **Lines**- Projection or construction lines very faint & open. Visible (solid)- hidden (broken)- axes with -45° lines very dark. Center lines (℄), extension lines, leader lines, dimension lines, arrowheads always moderately dark. Precedence of lines:- hidden line over center line (℄), solid line over hidden line. Center lines (℄)- very important in circular objects. **Dimensioning** :- Don't write digits below or beside the dimension lines [to avoid confusion always write digits in the central portion neither below nor on top], the unit of dimension is in mm(millimeter) but Never write mm, mm, mm, after the digits. Write F for Front view or Elevation, T for Top view or Plan, (L/R) SV for (left/right) Side view or Side Elevation. **Imp. To know** :-Which view [F, T or (L/R) SV] to draw 1st ?[Any but circular items first] How to select FV? [Widest]. Try to finish 3 views in max 50 min. For practice put the question near your answer paper. Use Very faint half (central) line for easy drawing in symmetrical objects to avoid calculation for dimensions, u know! In inclined line if u draw one dimension the other comes automatically. From which Special Object to start doing the 3 views? [Sofa w/o legs]

Q2 Geometrical Construction[FM20] – given & asked things only dark, construction lines/ curves very faint, no need to write steps or write names and dimensions. "Vital 4 things in GC- correctness, graphical way, procedural lines." Take care of time taken. Try to minimize instrumental errors by intelligent practice & common sense. •••


Excluding
Including
R (Given)
R+r1
R-r2
R-r1
Excluding
Bigger
Including
Smaller
(Read Q. Clearly
assume any data)
For Exact data
Refer QB. Vol 2, #492
Q2 (r)
(Acute)
Angle
Assume any data
For exact data
Refer QB Vol 2
#492
Q2 (P)
#116
91#
117
Q2 (r)
(right angle)
Q2 (r)
(obtuse)
Understand
1st → Q2 (r)
then 2nd → Q2 (e) (P)
then only → Q2 (y)
(Read Questions
clearly if necessary
assume any data)
Q2 (S)
Excl.
Incl.
See Vol 2 (QB)
#492 Q.No. 15
Q2 (9)
Excluding
Including
#117
61#