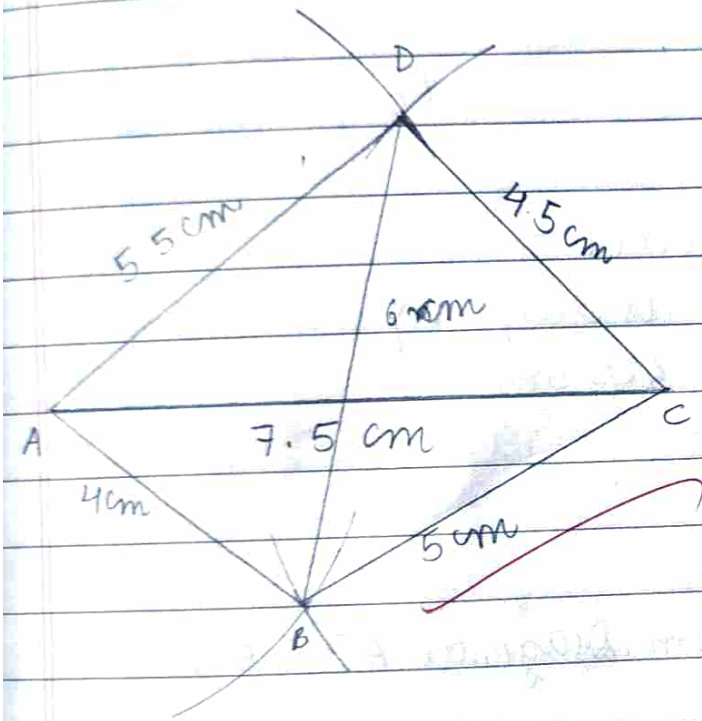
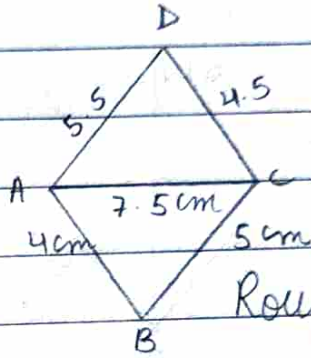
Chapter-12
Construction of Quadrilateral

WS-1

Quad. ABCD -
AB = 4 cm, BC = 5 cm, CD = 4.5 cm, AD = 5.5 cm
Diagonal AC = 7.5 cm

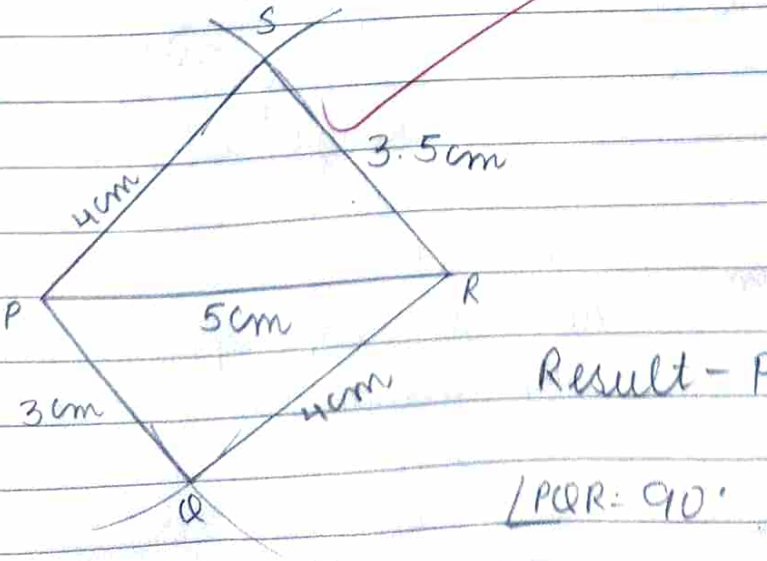


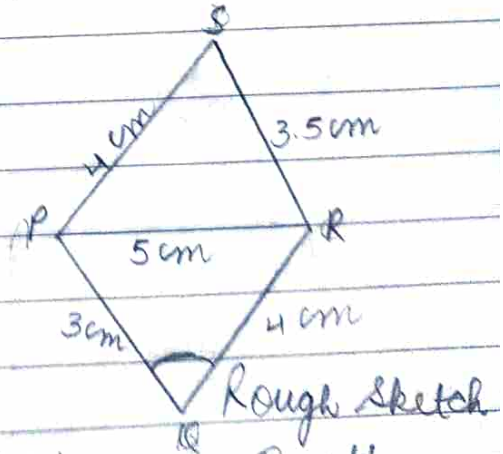


Rough Sketch

Result - ABCD is required quadrilateral in which BD = 6 cm

2: Quad PQRS - PQ = 3cm, QR = 4cm, RS = 3.5 cm, SP = 4cm.
PR = 5 cm, ∠PQR = ?





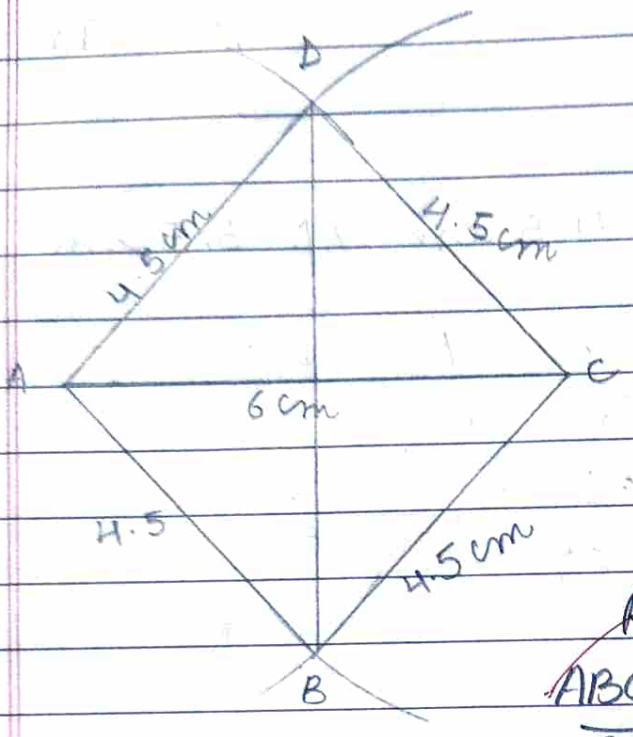
Rough Sketch

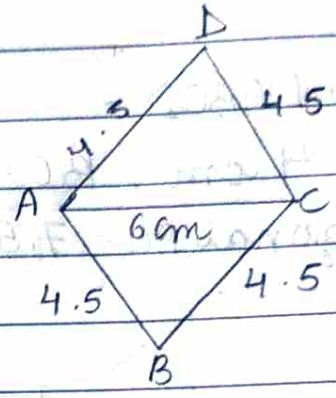
Result - PQRS is req. Quad.

∠PQR = 90°

Q4: Quad. ABCD -

Each side = 4.5 cm, Diagonal $\overline{AC}$ = 6 cm





Rough sketch

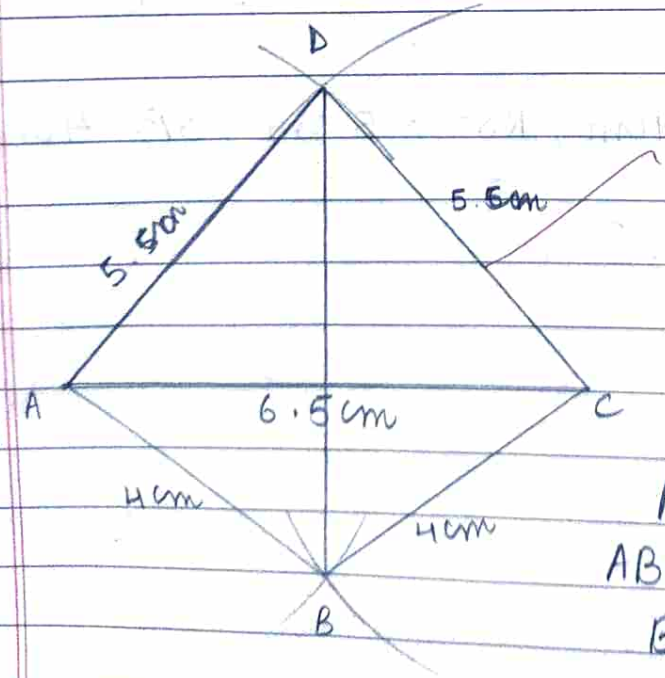
Result -

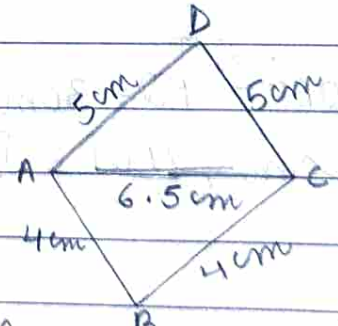
ABCD is req. quadrilateral

$\overline{BD}$ = 6.5 cm

Q3: Quad. ABCD -

$\overline{AB} = \overline{BC}$ = 4 cm, $\overline{CD} = \overline{AD}$ = 5 cm, Diagonal $\overline{AC}$ = 6.5 cm





Rough sketch

Result -

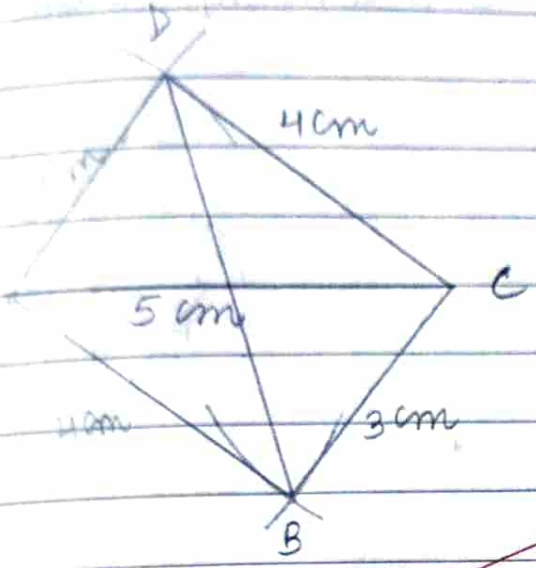
ABCD is req. quadrilateral

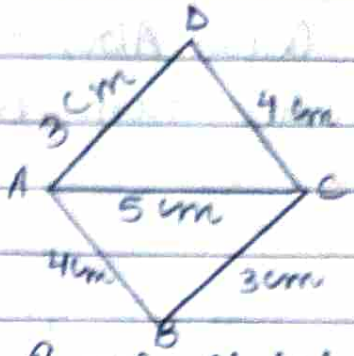
BD = 6.3 cm

5: Quad. ABCD -

AB = 4 cm, BC = 3 cm, CD = 4 cm, AD = 3 cm

Diagonal AC = 5 cm





Rough sketch

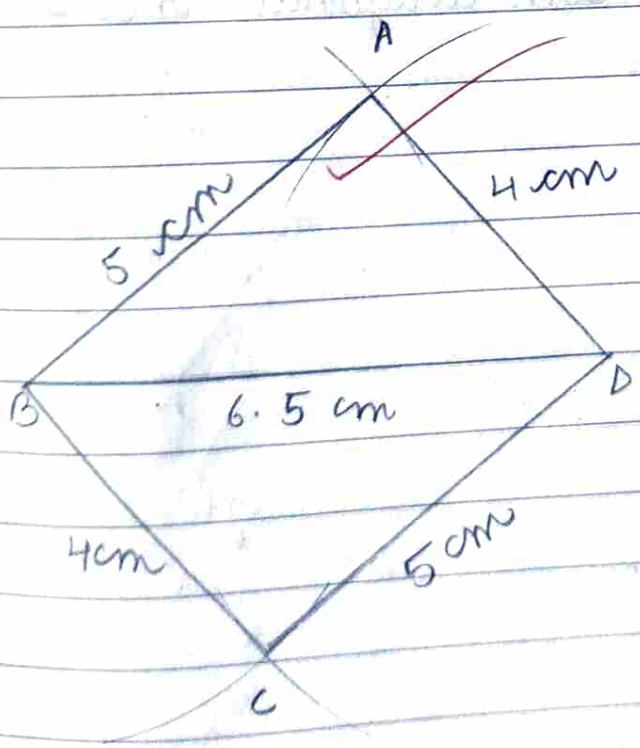
Result - ABCD is req. Quadrilateral

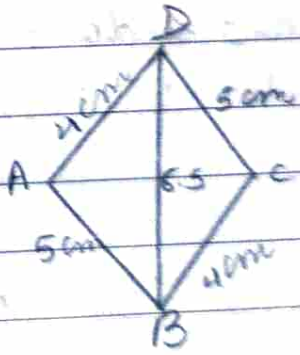
AC = BD = 5 cm

∠A = 90°

6: Quad. ABCD -

AB = CD = 5 cm, BC = AD = 4 cm, BD = 6.5 cm





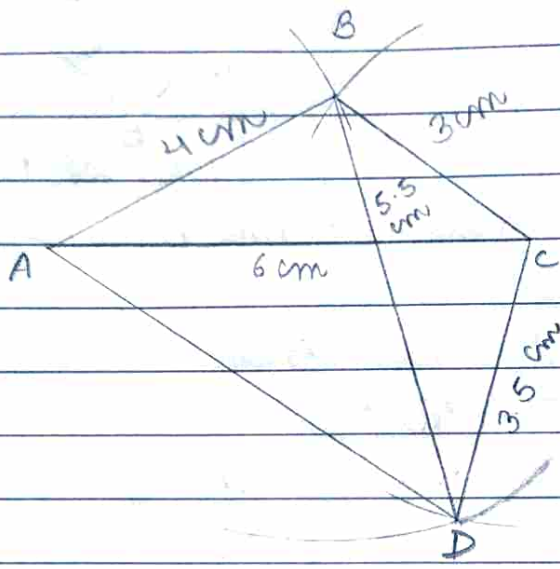
Rough sketch

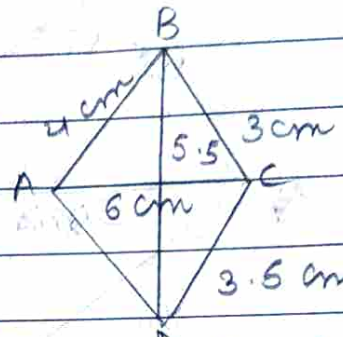
Result - ABCD is the req. Quadrilateral

WS-2

Q1: Quad. ABCD –

AB = 4 cm, BC = 3 cm, CD = 3.5 cm, AD = 6 cm, BD = 5.5 cm





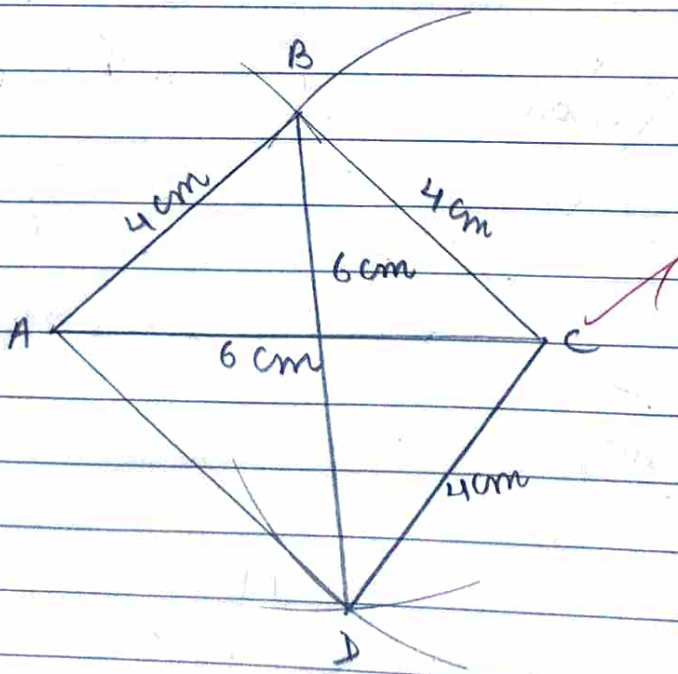
Rough Sketch

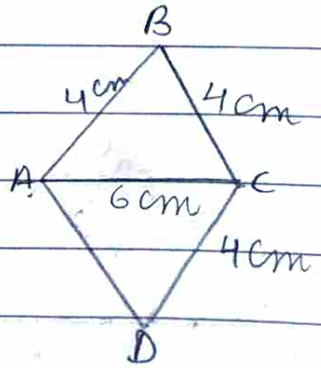
Result –

Quad. ABCD is req. quad.

Q2: Quad. ABCD –

3 sides = 4 cm each, both diagonals are 6 cm





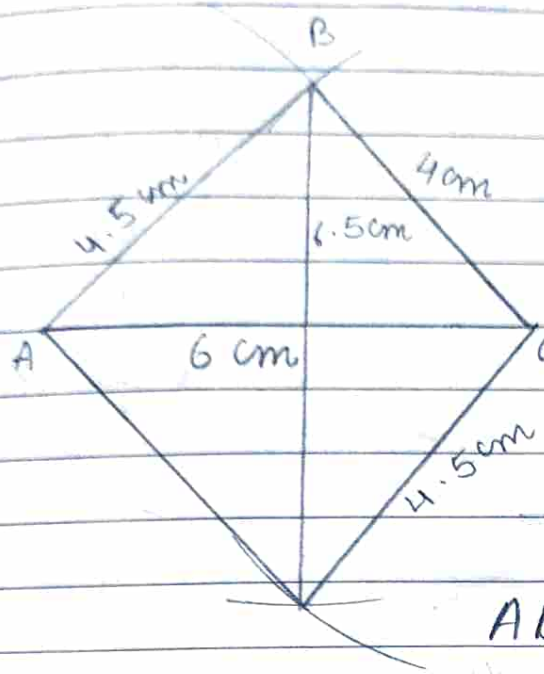
Rough Sketch

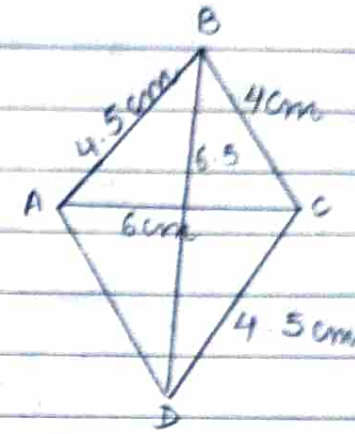
Result –

ABCD is req. Quad.

Q5: Quad. ABCD –

AB = 4.5 cm, BC = 4 cm, CD = 4.5 cm, AC = 6 cm, BD = 6.5 cm





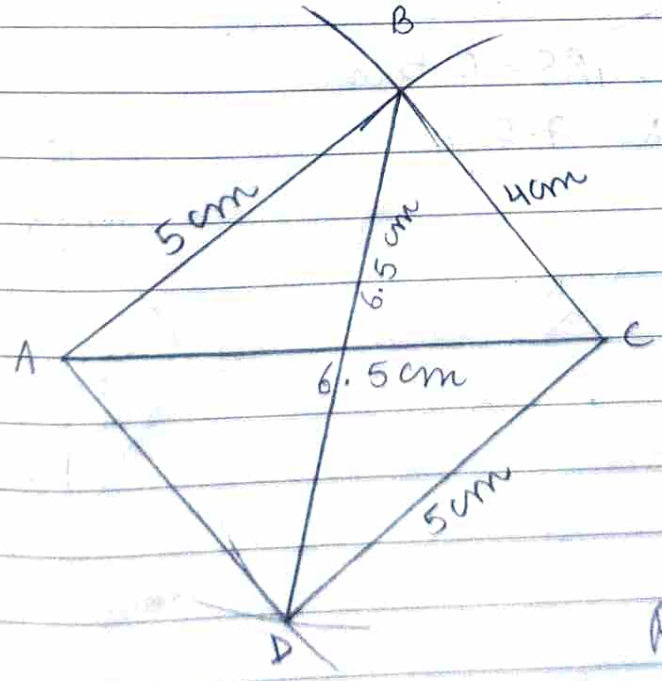
Rough Sketch

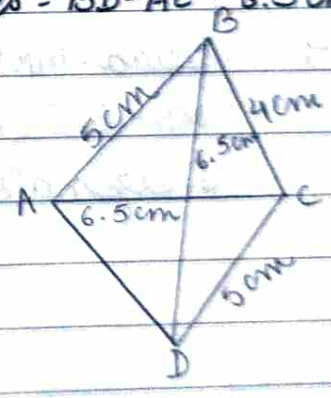
Result –

ABCD is the req. Quadrilateral

Q6: Quad. ABCD –

AB = 5 cm, BC = 4 cm, CD = 5 cm, Diagonals = BD = AC = 6.5 cm





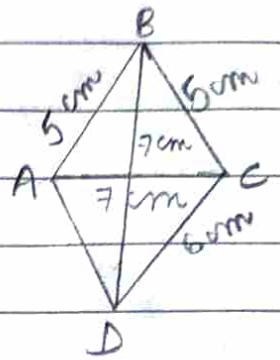
Rough Sketch

Result –

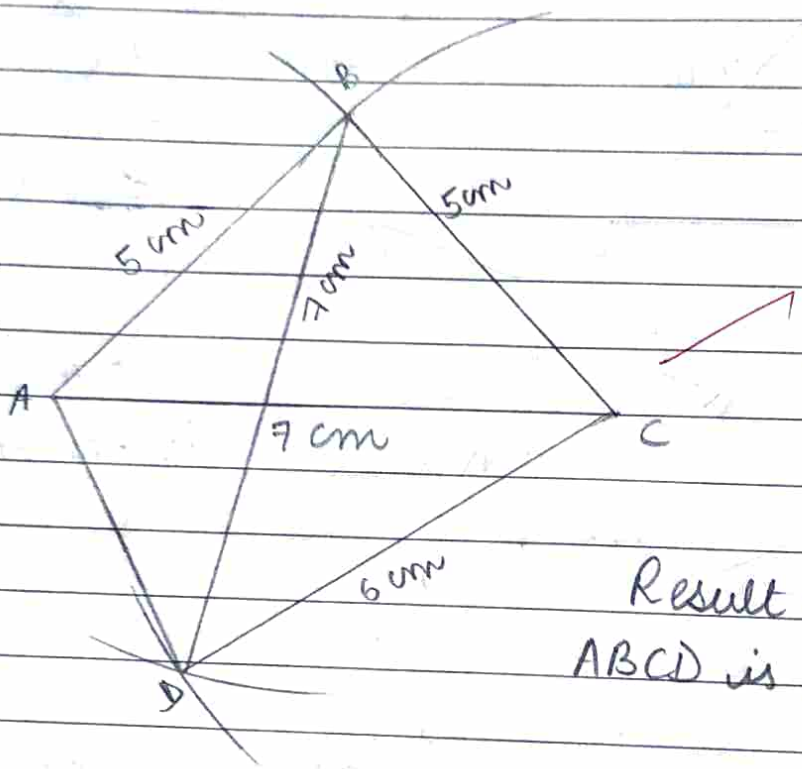
ABCD is the req. quadrilateral

Q2: Quad. ABCD –

AB = BC = 5 cm, CD = 6 cm, diagonals = 7 cm each



Rough Sketch



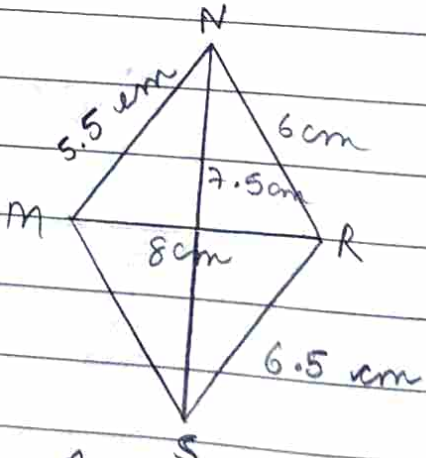
Result –

ABCD is the req. quad.

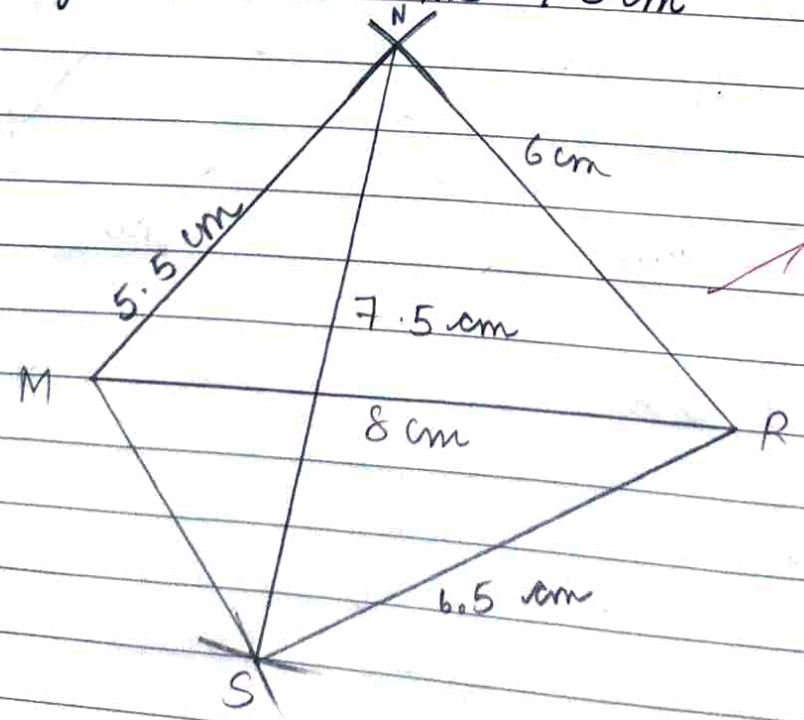
Q4: Quad. MNRS –

MN = 5.5 cm, NR = 6 cm, RS = 6.5 cm

Diagonals MR = 8 cm, NS = 7.5 cm



Rough Sketch



Result - ABCD is the req. Quadrilateral

WS-3

Q1: Quad ABCD :-

AB = 3.5 cm, BC = 6.5 cm, $\angle A = 60°$; $\angle C = 120°$, $\angle D = 75°$

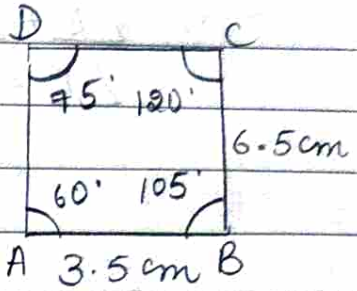
Using ASP in Quad. ABCD

$\angle A + \angle B + \angle C + \angle D = 360°$

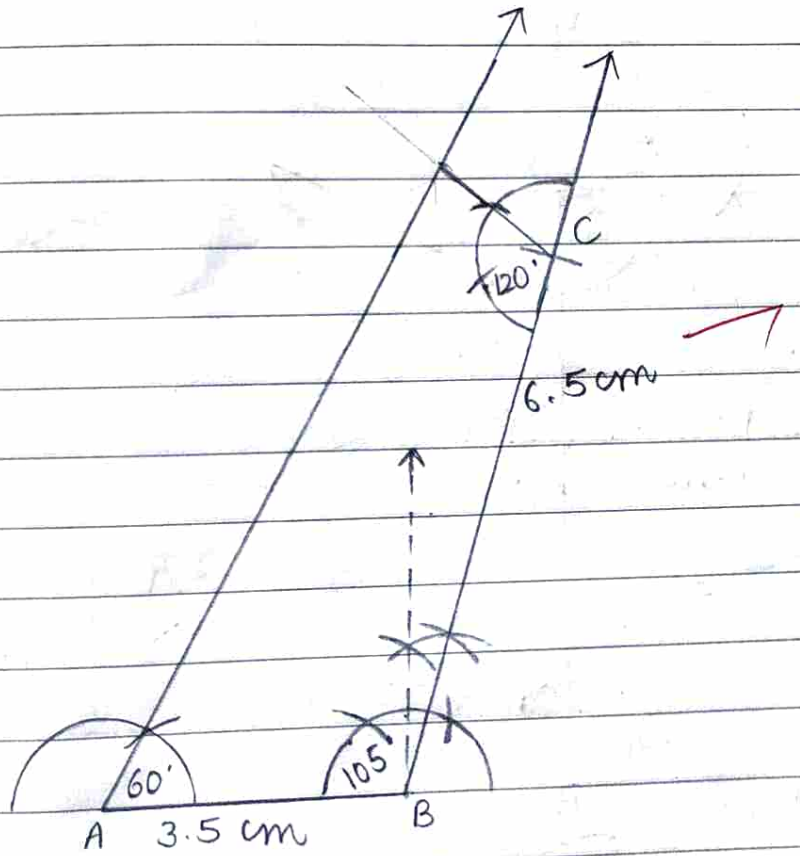
$60° + \angle B + 120° + 75° = 360°$

$\angle B + 255° = 360°$

$\angle B = 360° - 255° = 105°$



Rough sketch



Result -

ABCD is the req. Quadrilateral

(ii) Quad. ABCD –

AB = 4 cm, BC = 7 cm, $\angle A = \angle C = 105°$, $\angle D = 60°$

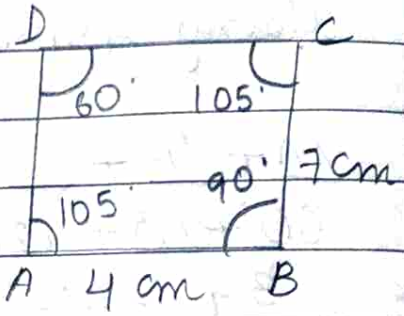
By using ASP in Quad. ABCD

$\angle A + \angle B + \angle C + \angle D = 360°$

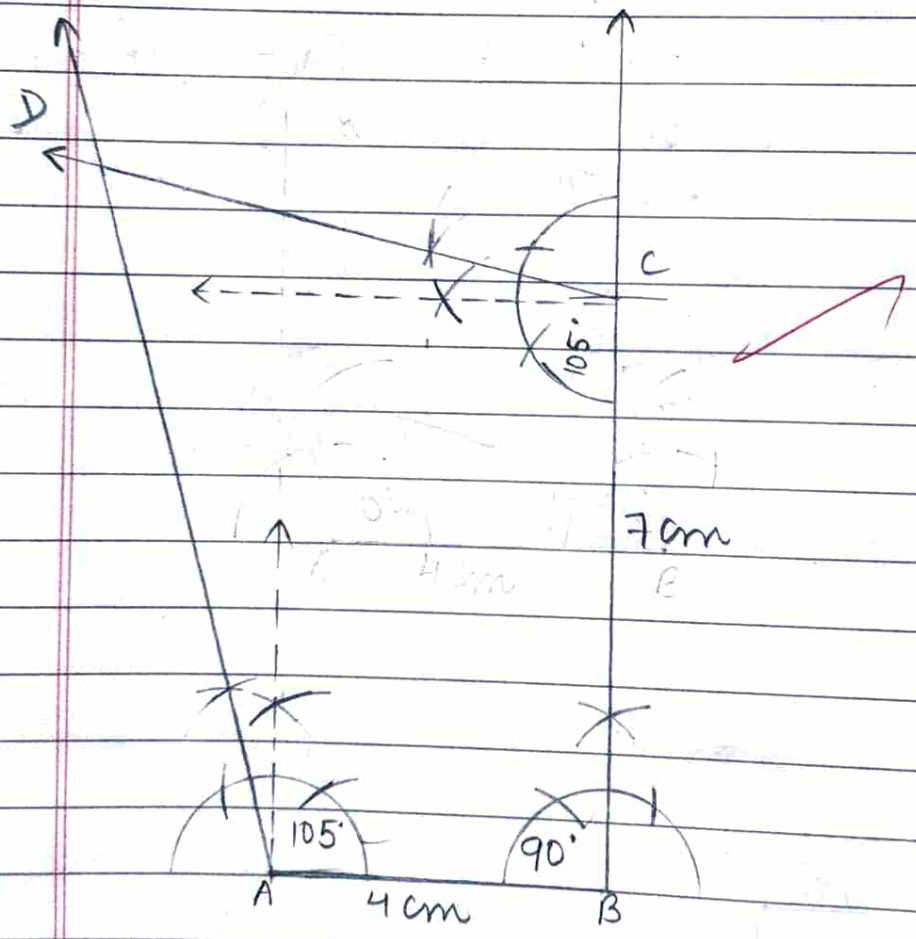
$105 + \angle B + 105 + 60° = 360°$

$\angle B + 270 = 360°$

$\angle B = 90°$



Rough Sketch

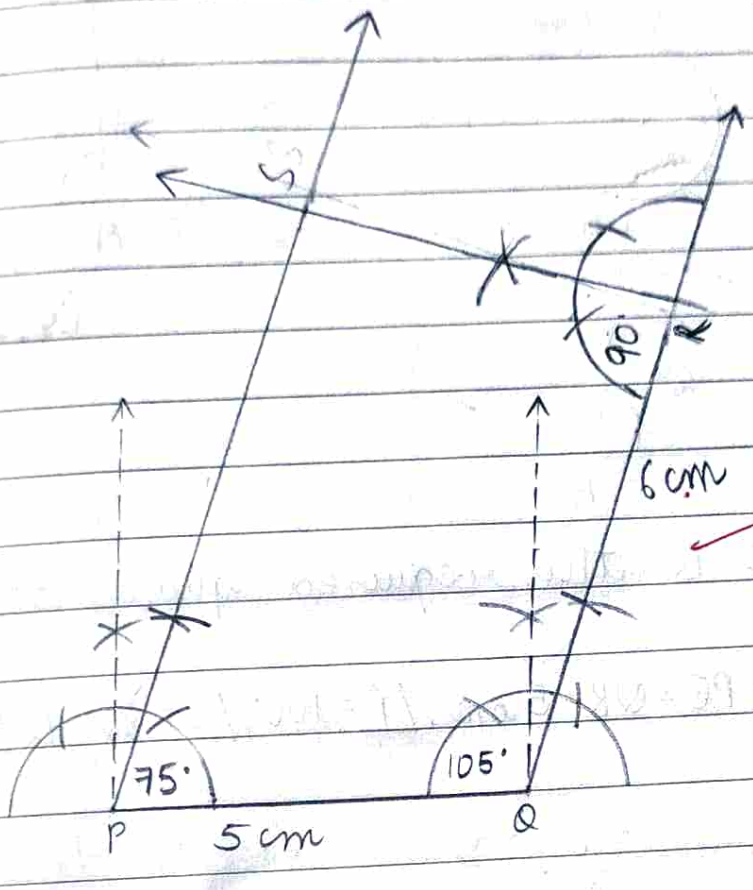


Result –

ABCD is the req. Quadrilateral

(iii) Quad. PQRS –

PQ = 5 cm, QR = 6 cm, $\angle P = 75°$; $\angle Q = 105°$, $\angle R = 90°$



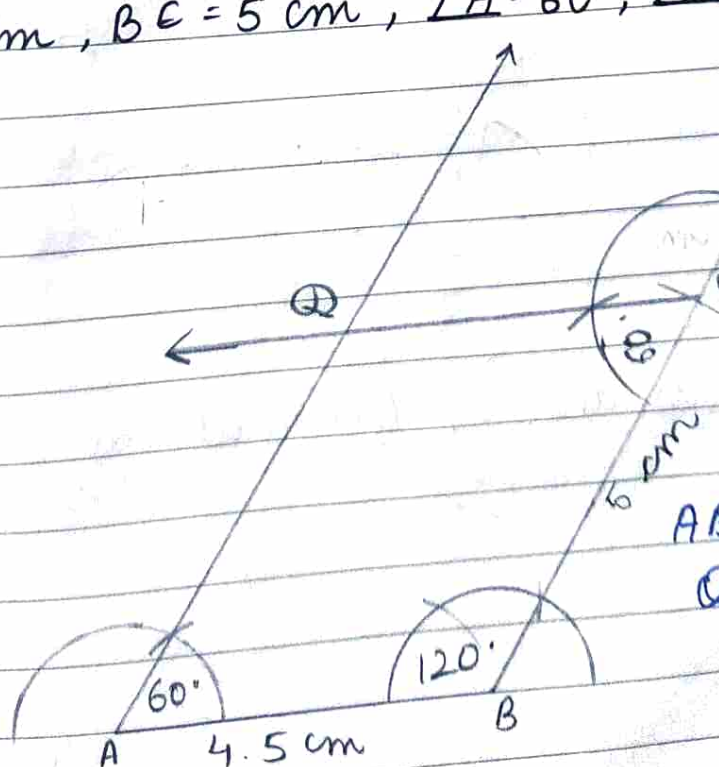
Rough Sketch

Result –

ABCD is the req. Quadrilateral

(iv) Quad. ABCD –

AB = 4.5 cm, BC = 5 cm, $\angle A = 60°$, $\angle B = 120°$, $\angle C = 60°$



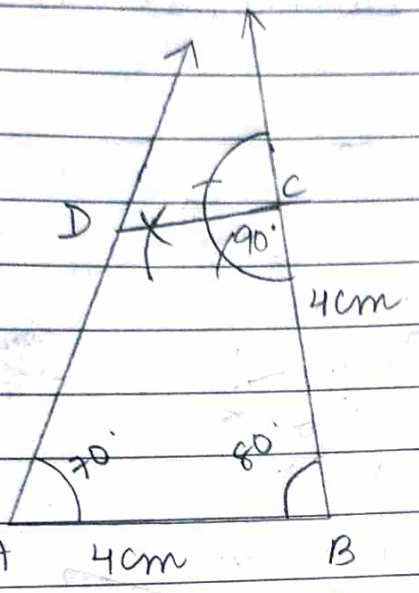
Rough Sketch

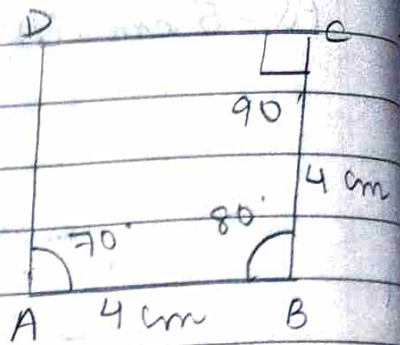
Result –

ABCD is the req. Quadrilateral

LI - Left Inner
RO - Right Outer

Q2: (i) Quad. ABCD - AB = 4cm, BC = 4cm, $\angle A = 70°$; $\angle B = 80°$, $\angle C = 90°$

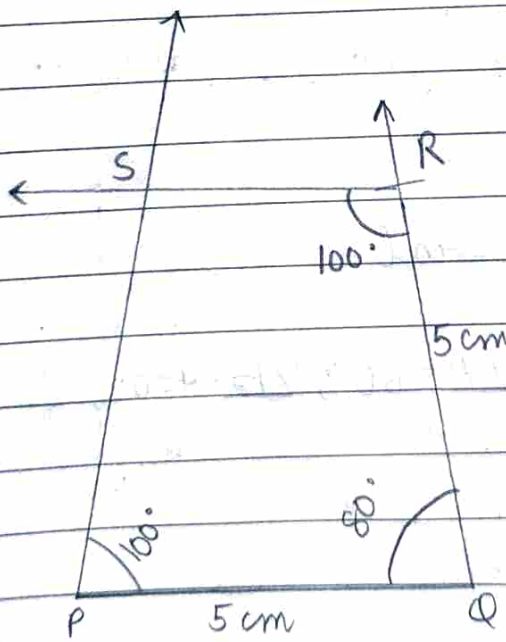


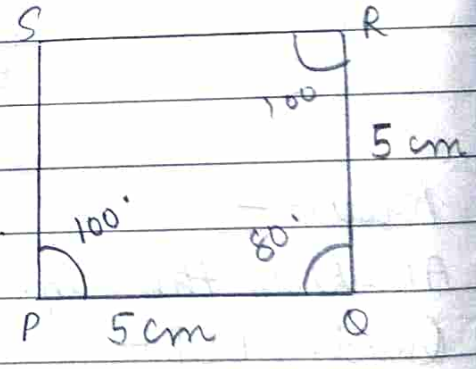


Rough sketch

Result - ABCD is the required quadrilateral

(ii) Quad. PQRS - PQ = QR = 5 cm, $\angle P = 100°$, $\angle Q = 80°$ & $\angle R = 100°$

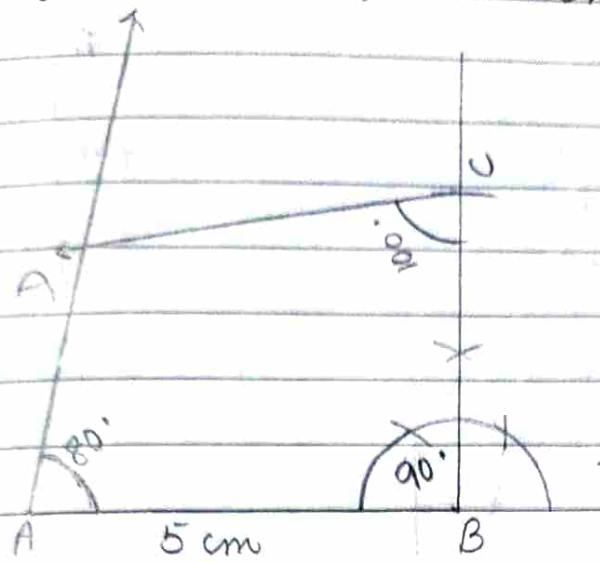


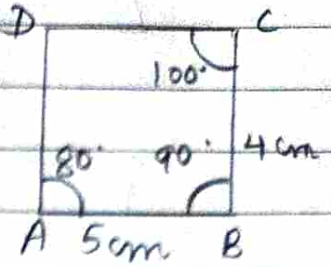


Rough sketch

Result - PQRS is the req. Quadrilateral

(iii) Quad. ABCD – AB = 5 cm, BC = 4 cm, ∠A = 80°, ∠B = 90°, ∠C = 100°



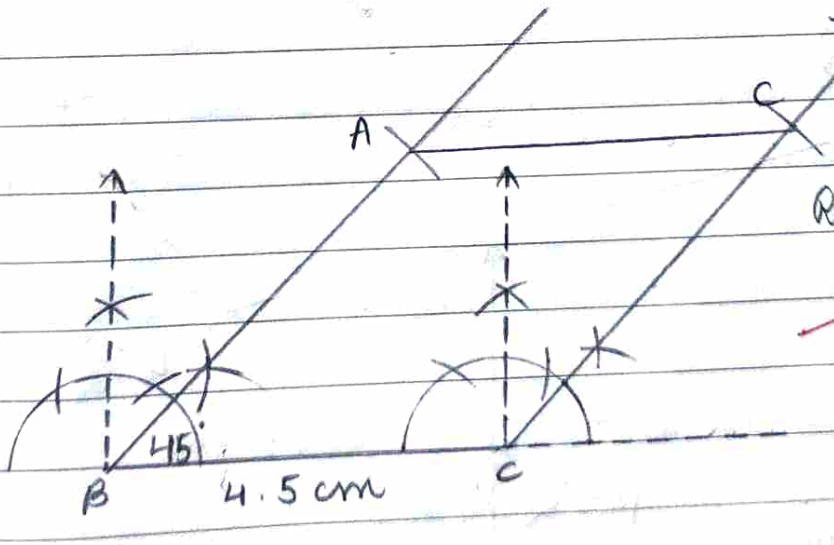


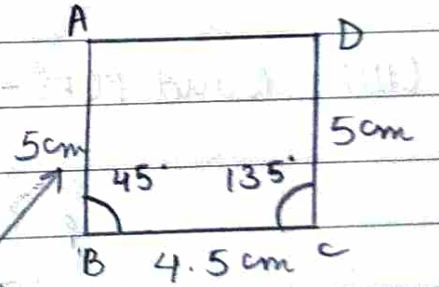
Rough sketch

Result – ABCD is the req. Quadrilateral

WS-4

Q1: (i) Quad. ABCD – AB = CD = 5 cm, BC = 4.5 cm, ∠B = 45°, ∠C = 135°

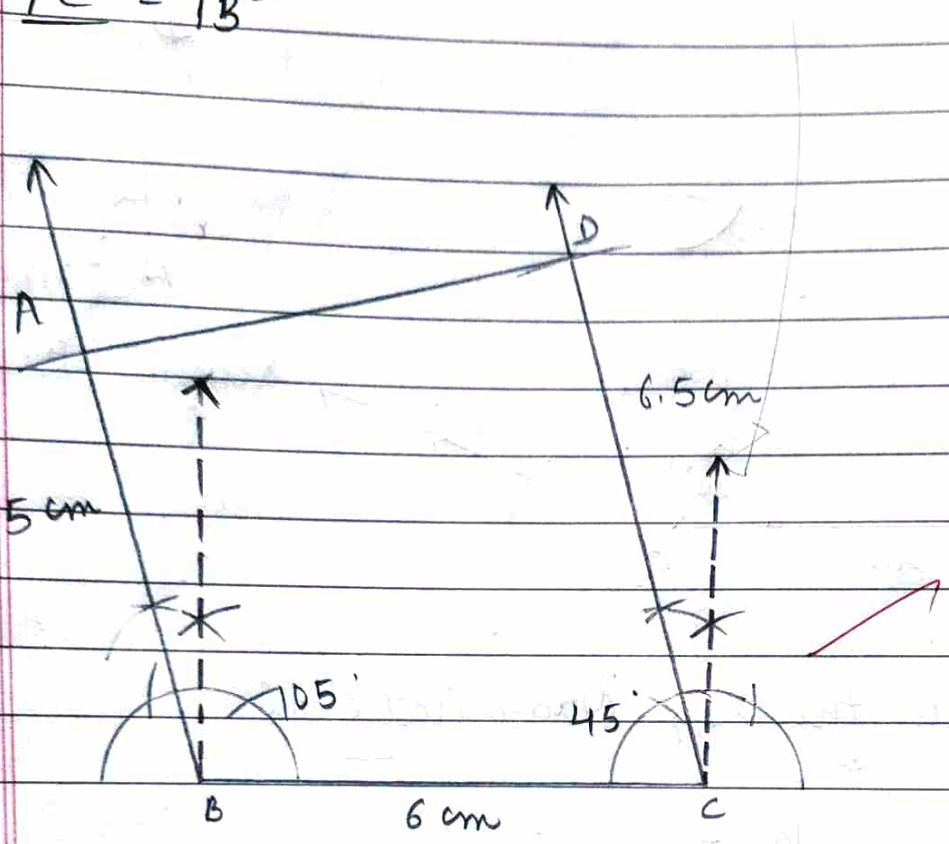


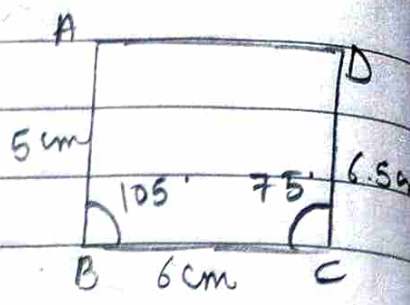


Rough sketch

Result – ABCD is the req. Quadrilateral

(ii) Quad. ABCD – AB = 5 cm, BC = 6 cm, CD = 6.5 cm, ∠B = 105°, ∠C = 75°

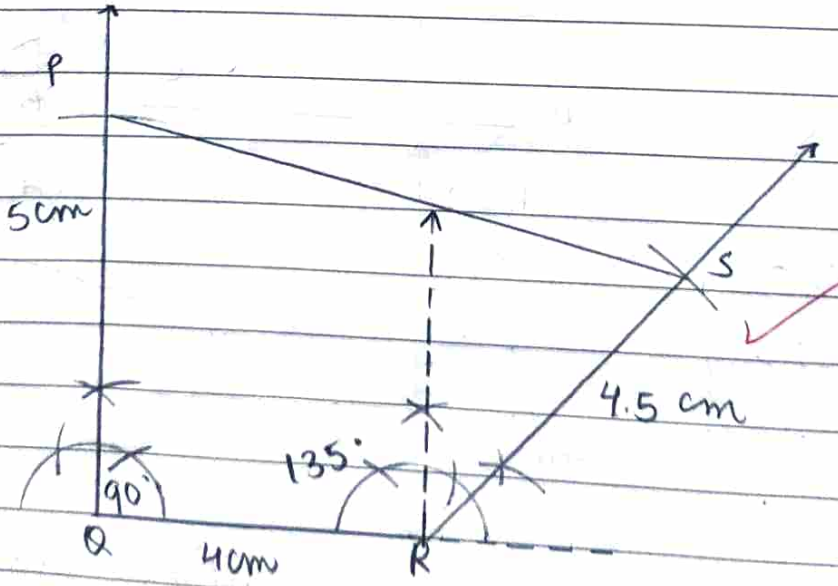


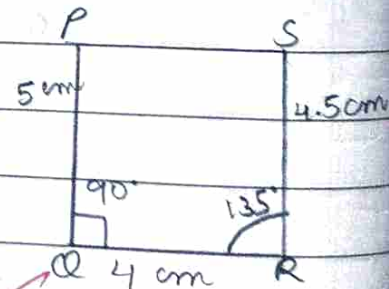


Rough sketch

Result – ABCD is the req. Quadrilateral

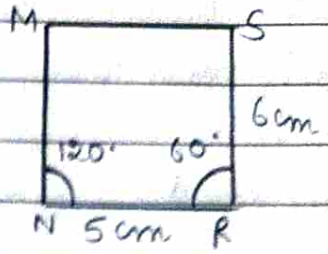
(iii) Quad. PQRS – PQ = 5 cm, QR = 4 cm, RS = 4.5 cm, ∠Q = 90°, ∠R = 135°



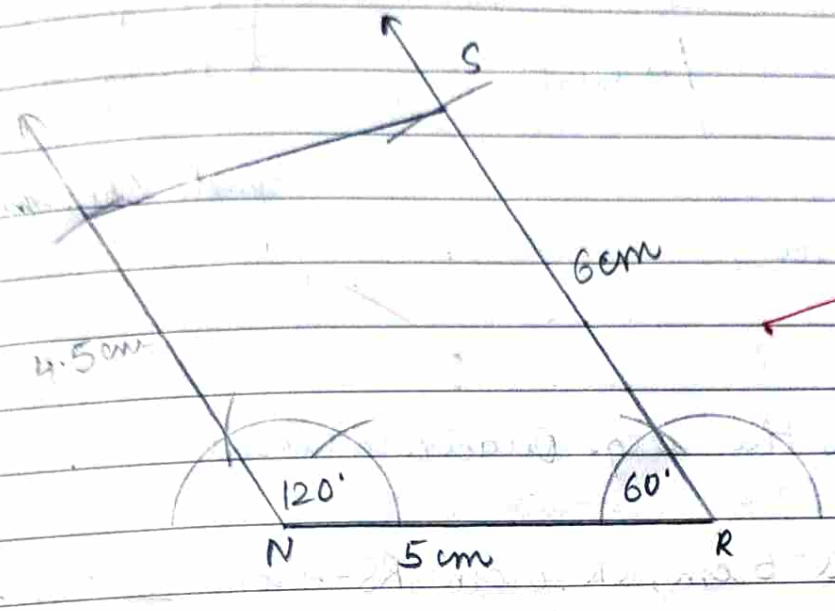


Result – PQRS is the req. Quadrilateral

(iv) Quad. MNRS — MN = 4.5 cm, NR = 5 cm, RS = 6 cm, $\angle N = 120°$, $\angle R = 60°$

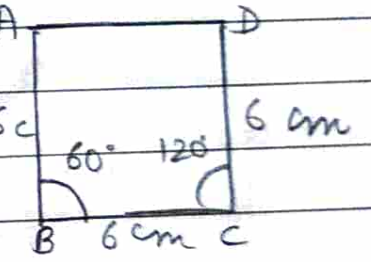


Rough sketch

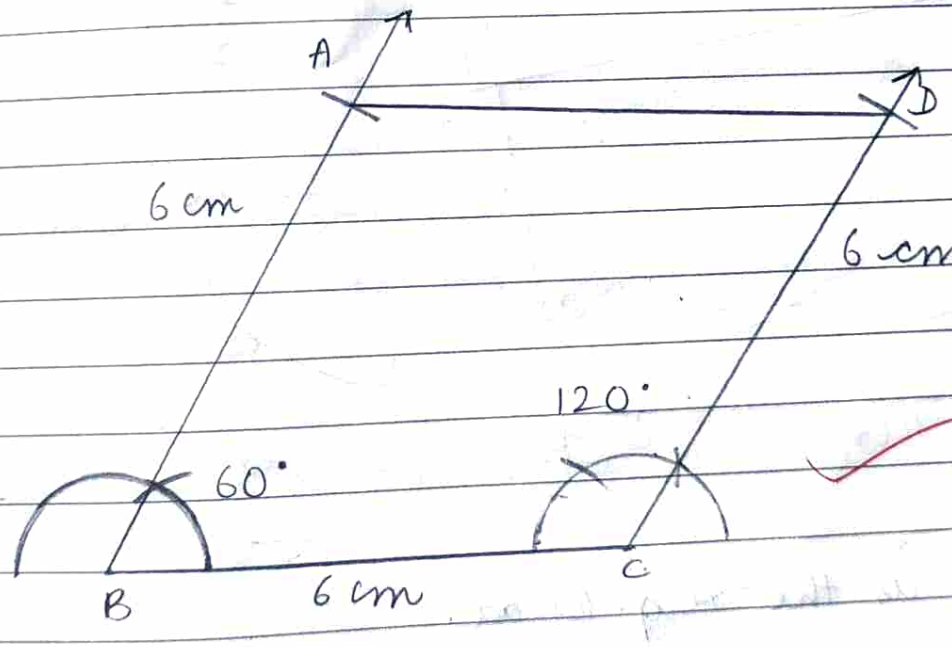


Result - MNRS is the req. Quadrilateral

(v) A Quad. ABCD — AB = BC = CD = 6 cm, $\angle B = 60°$, $\angle C = 120°$

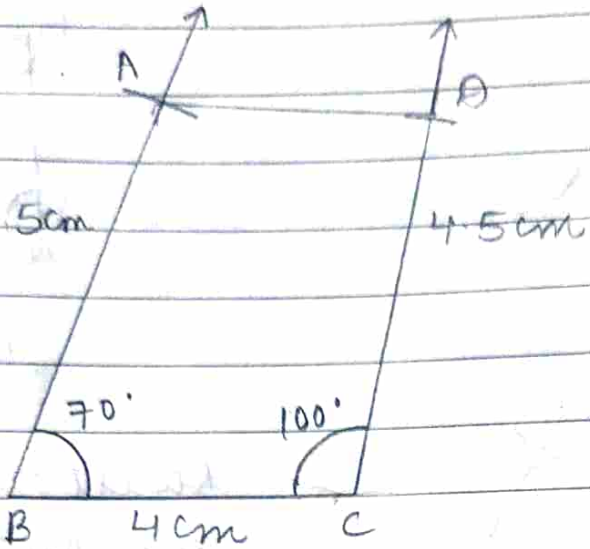


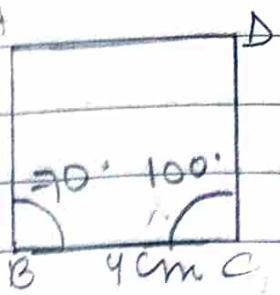
Rough sketch



Result - ABCD is the req. Quadrilateral

Q2: (i) Quad. ABCD — AB = 5 cm, BC = 4 cm, CD = 4.5 cm, ∠B = 70°, ∠C = 10

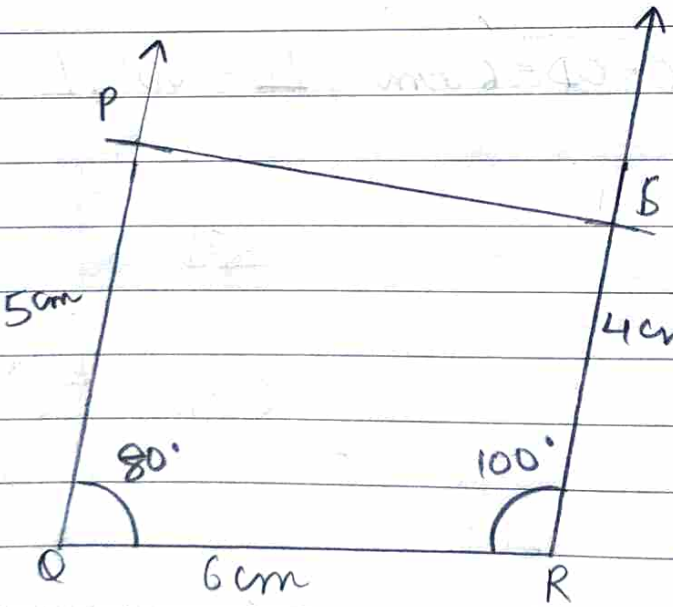


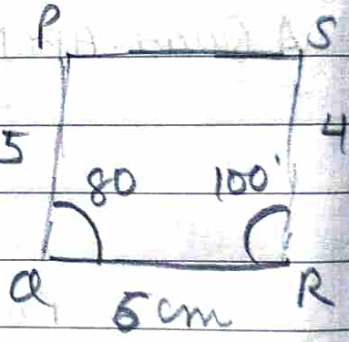


Rough Sketch

Result - ABCD is the req. Quadrilateral

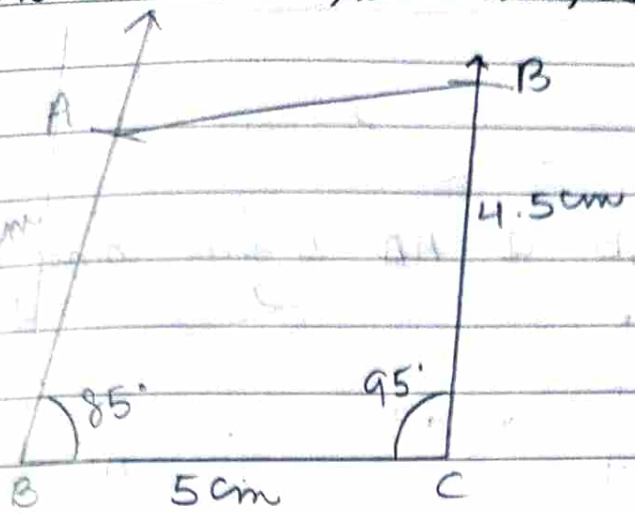
(ii) Quad. PQRS — PQ = 5 cm, QR = 6 cm, RS = 4 cm, ∠Q = 80°, ∠R = 10

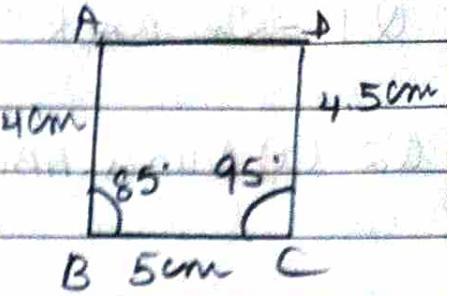




Result - PQRS is the req. Quad.

(iii) Quad. ABCD – AB = 4 cm, BC = 5 cm, CD = 4.5 cm, ∠B = 85°, ∠C = 95°

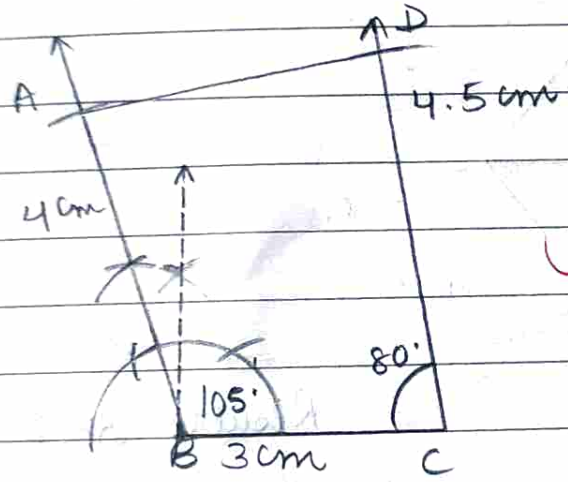


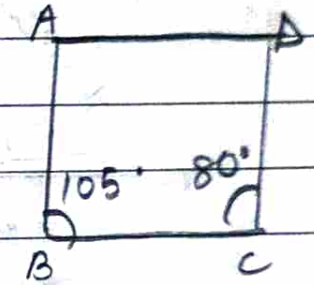


Rough Sketch

Result - ABCD is the req. Quadrilateral

(iv) Quad. ABCD – AB = 4 cm, BC = 3 cm, CD = 4.5 cm, ∠B = 105°, ∠C = 80°

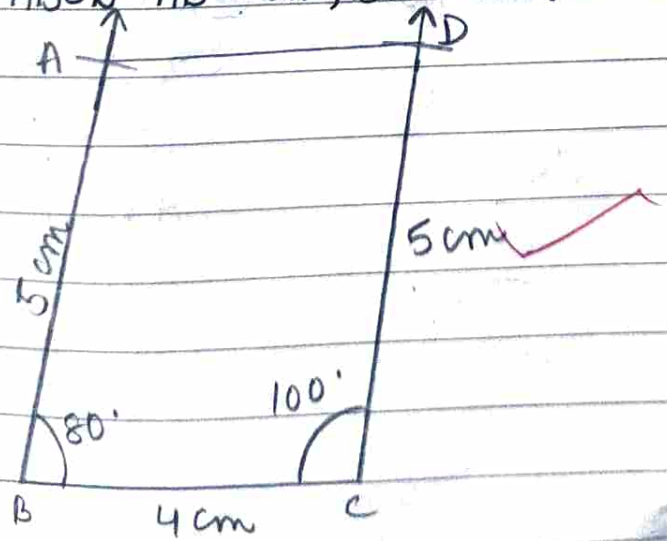


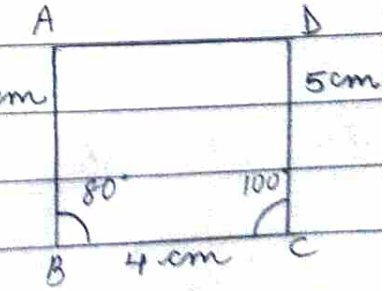


Rough Sketch

Result - ABCD is the req. Quadrilateral

(v) Quad. ABCD – AB = 5 cm, BC = 4 cm, CD = 5 cm, ∠B = 80°, ∠C = 100°





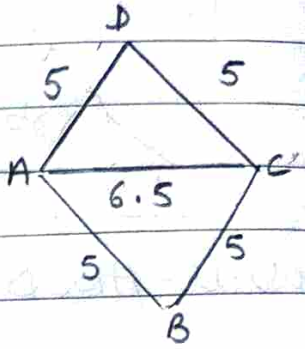
Rough Sketch

Result - ABCD is the req. Quadrilateral

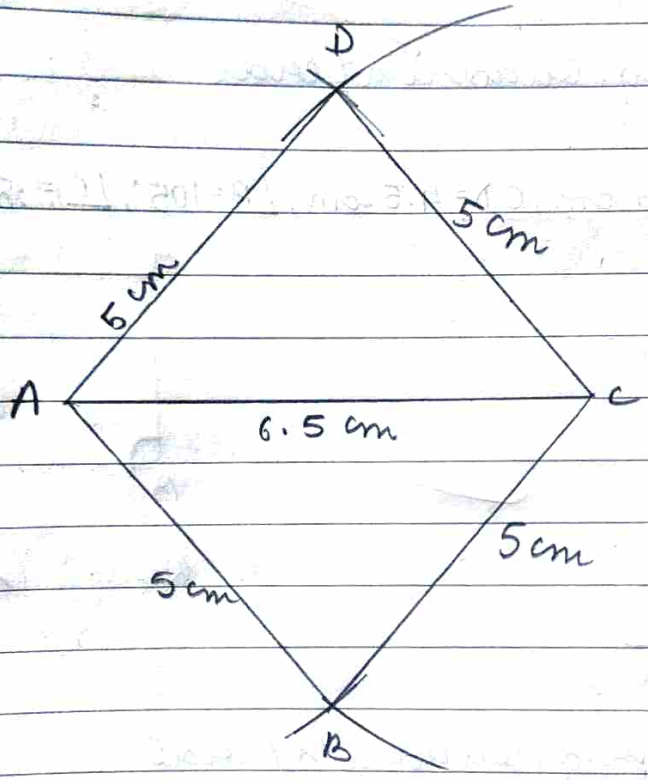
Brain Teasers

Q1 - In Book

Q2: (a) Quad. ABCD - AB = BC = CD = AD = 5 cm and AC = 6.5 cm

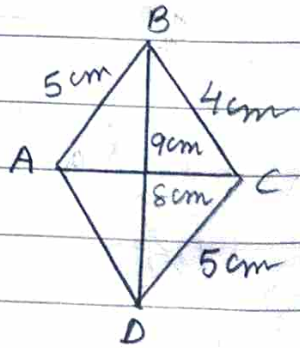


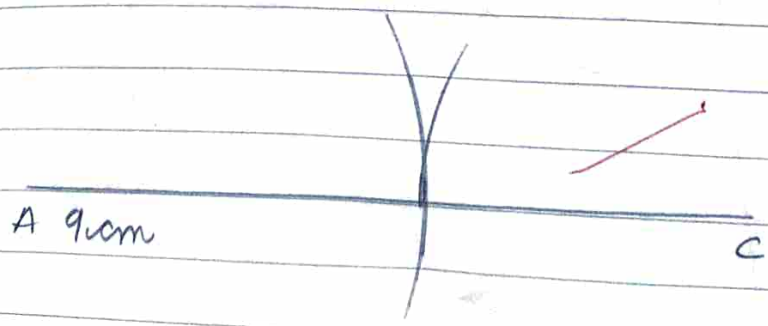
Rough Sketch



Result - ABCD is the req. Quadrilateral.

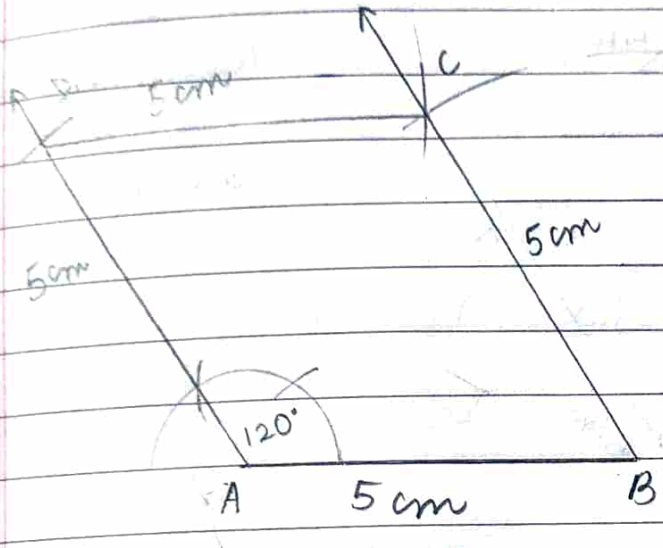
(c) Quad. ABCD - AB = CD = 5 cm, BC = 4 cm, AC = 8 cm, BD = 9 cm

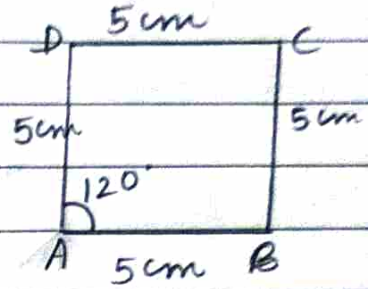




Result - This construction is not possible in ΔABC
$AB + BC = AC$,
which is not possible because sum of 2 side of Triangle must be greater than the 3rd side.

(d) Quad. ~~PQRS~~ ABCD - $AB = BC = CD = DA = 5$ cm and $\angle A = 120°$

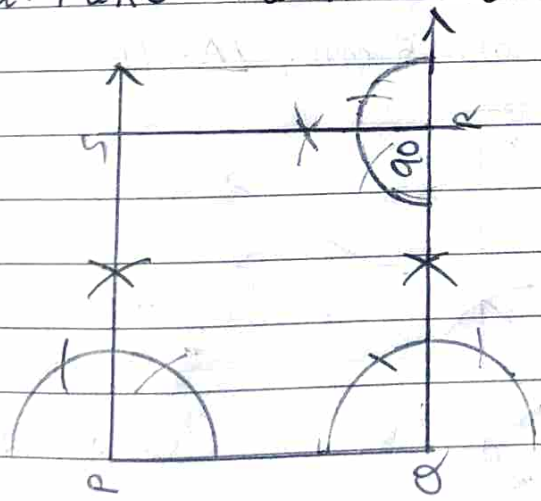


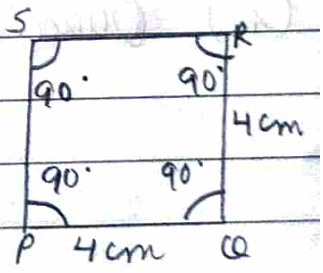


Rough sketch

Result - ABCD is the req. Quadrilateral

(e) Quad. PQRS - $PQ = RQ = 4$ cm, $\angle P = \angle Q = \angle R = \angle S = 90°$

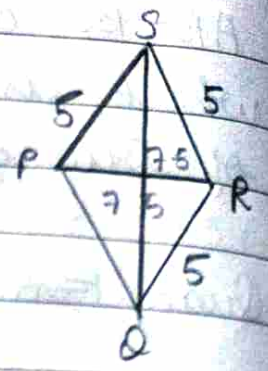




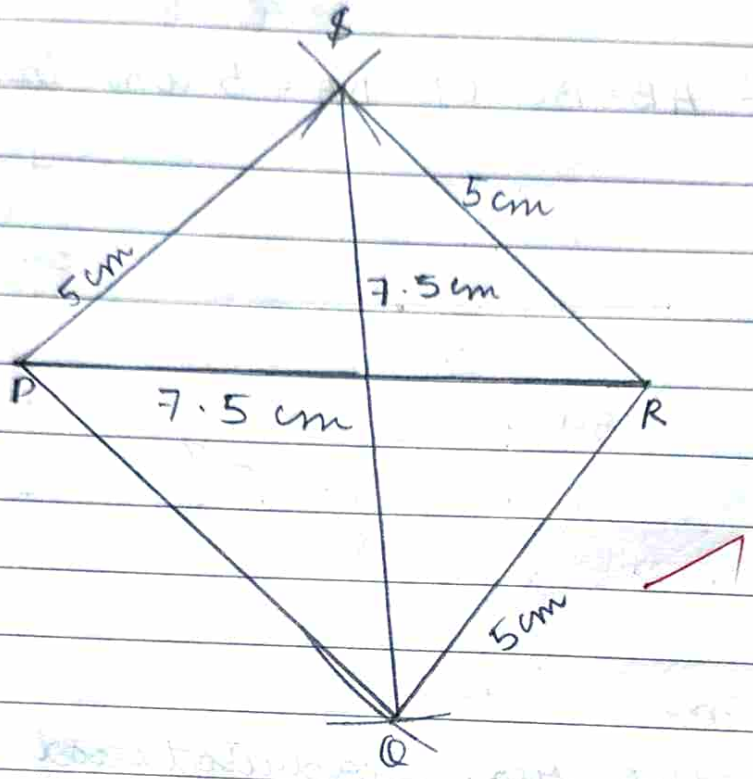
Rough sketch

Result - PQRS is the req. Quadrilateral

(b) Quad. PQRS – PQ = QR = RS = 5 cm, PR = RS = 7.5 cm

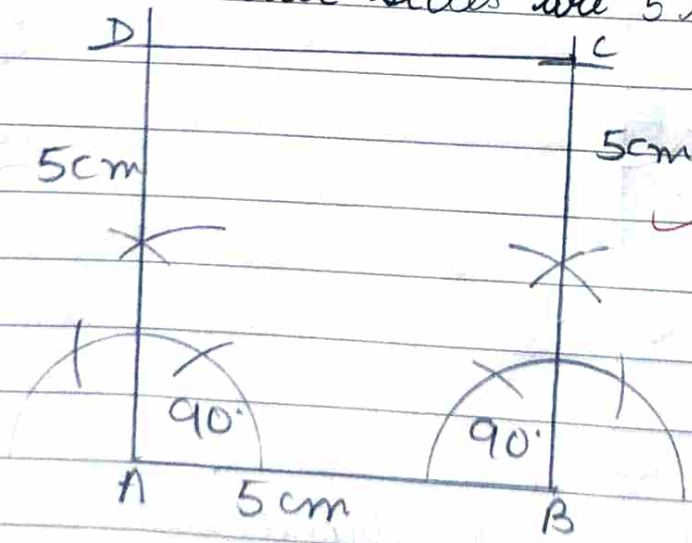


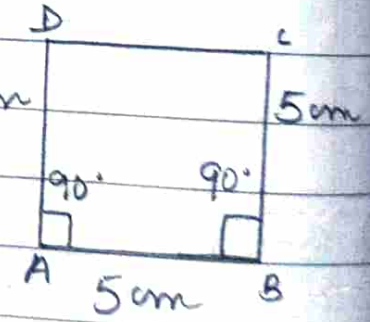
Rough sketch



Result – PQRS is the req. Quadrilateral

(h) Quad. ABCD – all sides are 5 cm, ∠A = ∠B = 90°

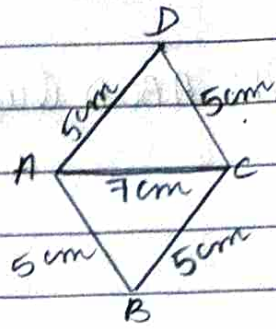




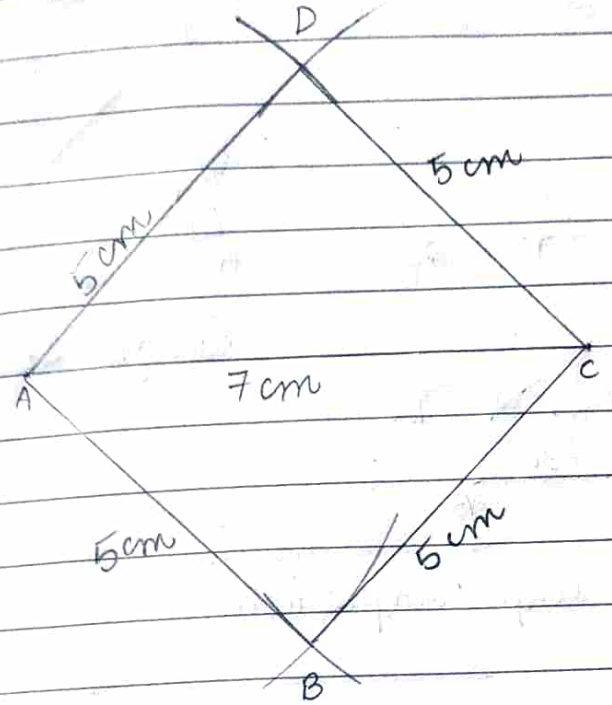
Rough sketch

Result – ABCD is the req. Quadrilateral

(f) Quad. ABCD – AB = BC = CD = AD = 5 cm, Diagonals AC = 7 cm

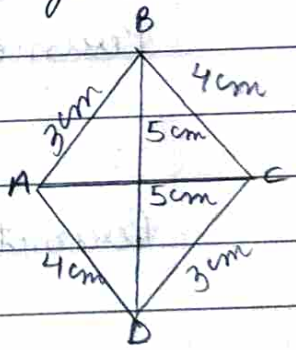


Rough Sketch

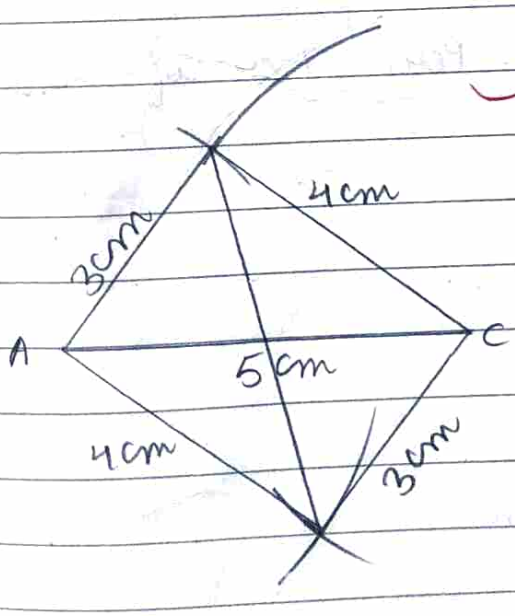


Result – ABCD is the req. Quadrilateral

(g) Quad. ABCD – AB = CD = 3 cm, BC = AD = 4 cm, diagonals 5 cm



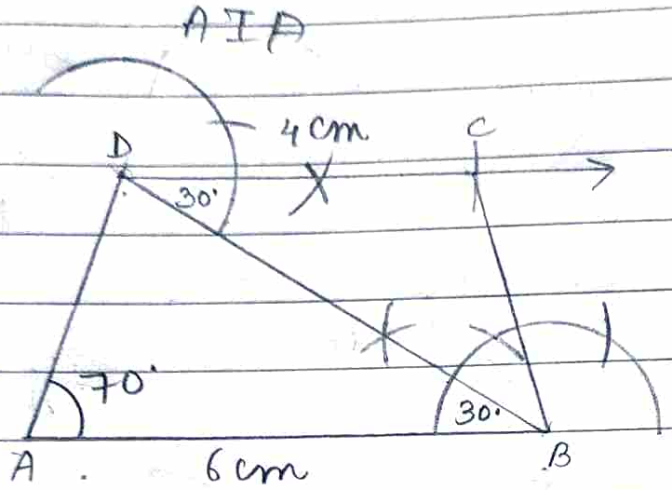
Rough Sketch

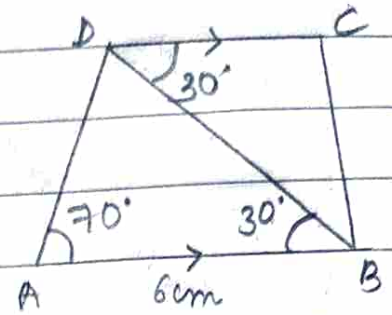


Result – ABCD is the req. Quadrilateral
It is a rectangle.

HOTS

Q1: ABCD Quad - AB = 6 cm, CD = 4 cm, $\angle A = 70°$, $\angle ABD = 30°$





Rough Sketch

Result - ABCD is the req. Trapezium

Q2: Let breadth of rectange be x cm

So length = 2x

Side of Rhombus = 6 cm

Perimeter = 4 × 6

= 24 cm

ATQ

Perimeter of rectangle = Perimeter of rhombus

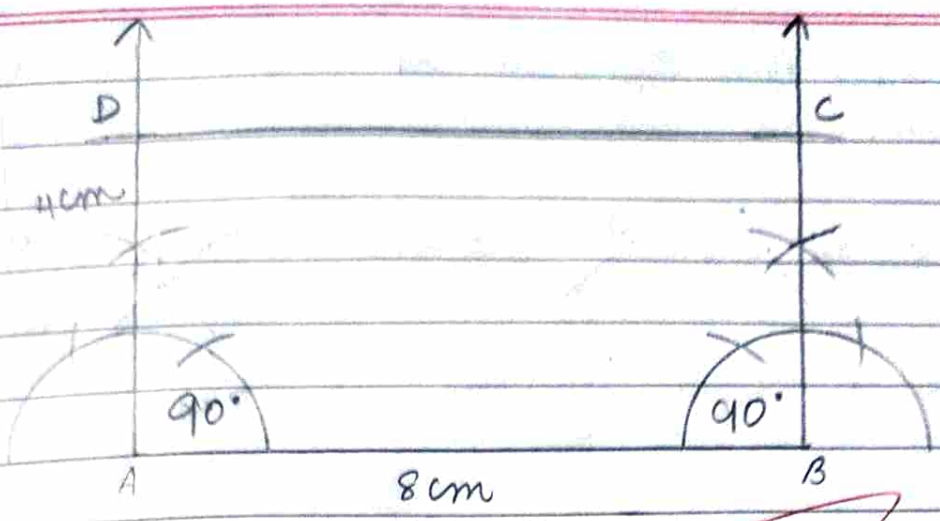
$2(2x + x) = 24$

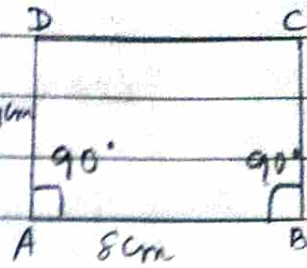
$3x = \frac{24}{2}\ 12$

$x = \frac{12}{3}\ 4$

So breadth = 4 cm

Length = 2 × 4 = 8 cm



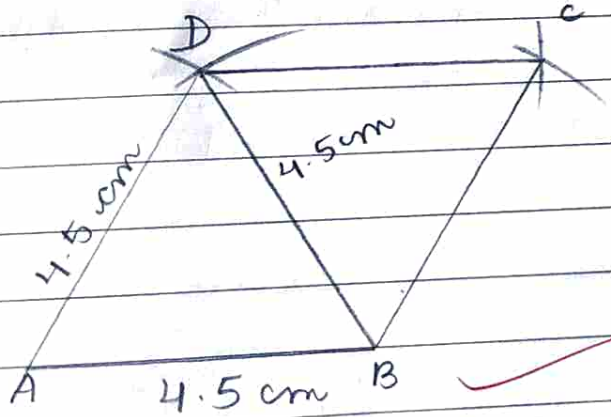


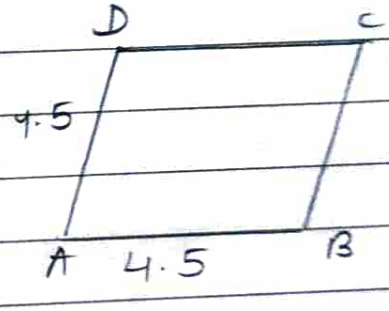
Rough sketch

Result - ABCD is the req. Rectangle

Enrichment Questions

Q1:





Rough sketch

ABCD is the req. Rhombus

Q2: Perimeter of Rhombus = 20 cm

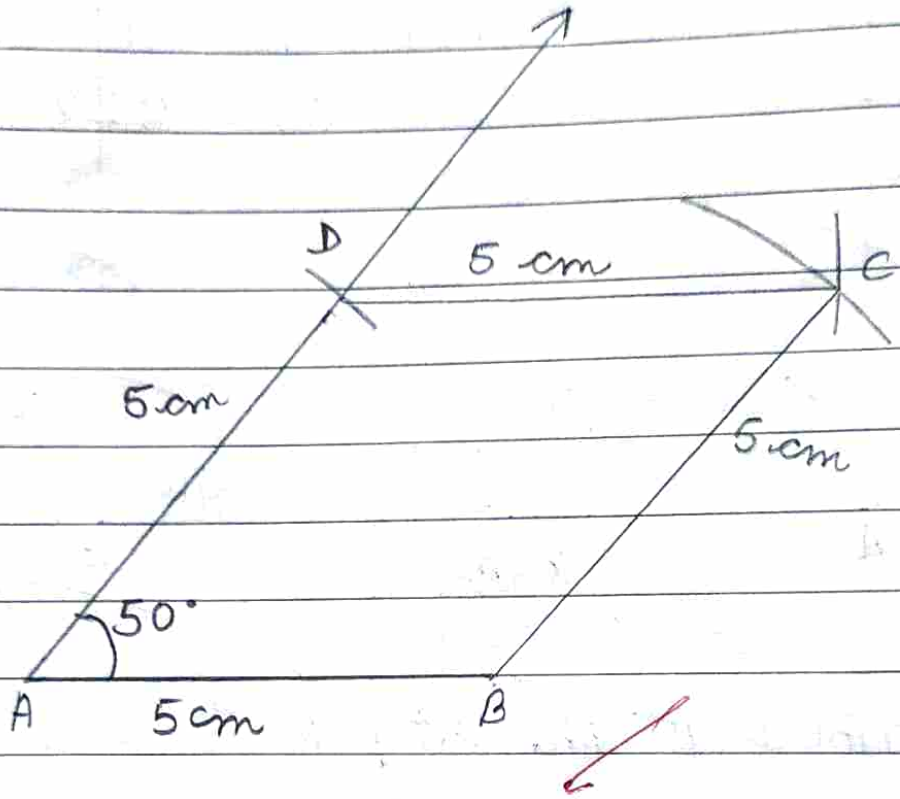
Since each side of rhombus is equal

So each side = $\frac{20}{4}$ 1 = 5 cm

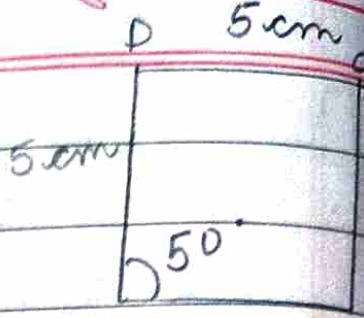
One angle of rhombus = Suppliment of 130°

180° - 130°

= 50°



Rough Sket



Result - ABCD is the req. Quadrilateral.