ICSE Class 9 Maths Selina Solutions Chapter 9: You may find the Selina answers to the questions in the Class 9 Selina textbooks' chapter 9, Triangles, here. Students study triangles in detail in this ICSE Class 9 Maths Selina Solutions Chapter 9, with a particular emphasis on congruency in triangles. Completing every question in the Selina textbook will enable students to receive full credit for the test.

ICSE Class 9 Maths Selina Solutions Chapter 9 is quite simple to comprehend. These answers address every exercise question in the book and follow the syllabus that the ICSE or CISCE has specified. ICSE Class 9 Maths Selina Solutions Chapter 9 is available here in PDF format, which can be accessed online or downloaded. Additionally, students can download these ICSE Class 9 Maths Selina Solutions Chapter 9 for free and use them offline for practice.

ICSE Class 9 Maths Selina Solutions Chapter 9 Overview

ICSE Class 9 Maths Selina Solutions Chapter 9 covers the topic of triangles, focusing on various properties and theorems related to them. The ICSE Class 9 Maths Selina Solutions Chapter 9 delves into different types of triangles (such as equilateral, isosceles, and scalene) and their specific properties. It also explores important concepts like the sum of interior angles in a triangle, the criteria for triangle congruence (such as SSS, SAS, and ASA), and the basic proportionality theorem.

The ICSE Class 9 Maths Selina Solutions Chapter 9 provides a detailed explanation of these properties and theorems, often supported by illustrative examples and exercises to help students understand and apply these concepts effectively in solving problems related to triangles.

ICSE Class 9 Maths Selina Solutions Chapter 9

Below we have provided ICSE Class 9 Maths Selina Solutions Chapter 9 –

1. Which of the following pairs of triangles are congruent? In each case, state the condition of congruency:

(a) In $\triangle$ ABC and $\triangle$ DEF, AB = DE, BC = EF and $\angle$B = $\angle$E.

(b) In $\triangle$ ABC and $\triangle$ DEF, $\angle$B = $\angle$E = 90°; AC = DF and BC = EF.

(c) In $\triangle$ ABC and $\triangle$ QRP, AB = QR, $\angle$B = $\angle$R and $\angle$C = $\angle$P.

(d) $\triangle$ PQR, AB = PQ, AC = PR and BC = QR.

(e) In $\triangle$ ABC and $\triangle$ PQR, BC = QR, $\angle$A = 90°, $\angle$C = $\angle$R = 40° and $\angle$Q=50°.

Solution:

(a) In ∆ ABC and ∆ DEF

AB = DE (data)

BC = EF and ∠B = ∠E (given)

By SAS criteria of congruency and given data, we can conclude that,

∆ ABC and ∆ DEF are congruent to each other.

Therefore, ∆ ABC ≅ ∆ DEF.

(b) Given in ∆ ABC and ∆ DEF,

∠B = ∠E = 90°;

AC = DF

That is hypotenuse AC = hypotenuse DF

and BC = EF

By right angle hypotenuse side postulate of congruency,

The given triangles ∆ ABC and ∆ DEF are congruent to each other.

Therefore, ∆ ABC ≅ ∆ DEF.

(c) In ∆ ABC and ∆ QRP,

Data: AB = QR,

∠B = ∠R and

∠C = ∠P.

By using the SAS postulate and the given data we can conclude that

The given triangles ∆ ABC and ∆ QRP are congruent to each other.

Therefore, ∆ ABC ≅ ∆ QRP.

(d) In In ∆ ABC and ∆ PQR,

Data: AB = PQ, AC = PR and BC = QR.

By using the SSS postulate of congruency and given data we can conclude that

The given triangles ∆ ABC and ∆ PQR are congruent to each other.

Therefore, Δ ABC ≅ Δ PQR.

(e) In Δ ABC and Δ PQR,

Data: BC = QR, $\angle A = 90^{o}$,

$\angle C = \angle R = 40^{o}$ and $\angle Q = 50^{o}$

But we know that the sum of the angle of the triangle = 180^{o}

Therefore, $\angle P + \angle Q + \angle R = 180^{o}$

$\angle P + 50^{o} + 40^{o} = 180^{o}$

$\angle P + 90^{o} = 180^{o}$

$\angle P = 180^{o} – 90^{o}$

$\angle P = 90^{o}$

In Δ ABC and Δ PQR,

$\angle A = \angle P$

$\angle C = \angle R$

BC = QR

According to the ASA postulate of congruency,

The given triangles Δ ABC and Δ PQR are congruent to each other.

Therefore, Δ ABC ≅ Δ PQR.

2. The given figure shows a circle with center O. P is the mid-point of chord AB.

Show that OP is perpendicular to AB.

Solution:

Data: in the given figure O center of the circle.

P is the mid-point of chord AB. AB is a chord

P is a point on AB such that AP = PB

Now we have to prove that OP $\perp$ AB

Construction: Join OA and OB

Proof: In Δ OAP and Δ OBP

OA = OB (because radii of the common circle)

OP = OP (common)

AP = PB (data)

To the SSS postulate of congruent triangles

The given triangles Δ OAP and Δ OBP are congruent to each other.

Therefore, Δ OAP ≅ Δ OBP.

The corresponding parts of the congruent triangles are congruent.

$\angle$OPA = $\angle$OPB (by Corresponding parts of Congruent triangles)

But $\angle$OPA + $\angle$OPB = 180° (linear pair)

$\angle$OPA = $\angle$OPB = 90°

Hence OP $\perp$ AB

3. The following figure shows a circle with center O.

If OP is perpendicular to AB, prove that AP=BP.

Solution:

Given: In the figure, O is the center of the circle,

And AB is a chord. P is a midpoint on AB such that AP = PB

We need to prove that AP = BP,

Construction: Join OA and OB

Proof: In right angle triangles Δ OAP and Δ OBP

Hypotenuse OA = Hypotenuse OB (because radii of the common circle)

Side OP = OP (common)

AP = PB (data)

To SSS postulate of congruent triangles

The given triangles Δ OAP and Δ OBP are congruent to each other.

Therefore, Δ OAP ≅ Δ OBP.

The corresponding parts of the congruent triangles are congruent.

AP = BP (by Corresponding parts of Congruent triangles)

Hence the proof.

4. In a triangle ABC, D is the mid-point of BC; AD is produced up to E so that DE = AD. Prove that: (i) Δ ABD and Δ ECD are congruent.

(ii) AB=EC

(iii) AB is parallel to EC.

Solution:

Given Δ ABC in which D is the mid-point of BC

AD is produced to E so that DE = AD

We need to prove that

(i) Δ ABD ≅ Δ ECD

(ii) AB = EC

(iii) AB ∥ EC

(i) In Δ ABD and Δ ECD

BD = DC (D is the midpoint of BC)

$\angle$ADB = $\angle$CDE (vertically opposite angles)

AD = DE (Given)

By the SAS postulate of congruency of triangles, we have

Δ ABD ≅ Δ ECD

(ii) The corresponding parts of congruent triangles are congruent

Therefore, AB = EC (corresponding parts of congruent triangles)

(iii) Also, we have $\angle$DAB = $\angle$DEC (corresponding parts of congruent triangles)

AB ∥ EC [$\angle$DAB = $\angle$DEC are alternate angles]

5. A triangle ABC has $\angle$B = $\angle$C. Prove that:

(i) The perpendiculars from the mid-point of BC to AB and AC are equal.

(ii) The perpendiculars from B and C to the opposite sides are equal.

Solution:

(i) Given Δ ABC in which ∠B = ∠C.

DL is perpendicular from D to AB

DM is the perpendicular from D to AC.

We need to prove that

DL = DM

Proof:

In Δ ABC and Δ DMC (DL perpendicular to AB and DM perpendicular to AC)

∠DLB = ∠DMC = 90°

∠B = ∠C (Given)

BD = DC (D is the midpoint of BC)

By AAS postulate of congruent triangles

Δ DLB ≅ Δ DMC

The corresponding parts of the congruent triangles are congruent

Therefore DL = DM

(ii) Given Δ ABC in which ∠B = ∠C.

BP is perpendicular from D to AC

CQ is the perpendicular from C to AB.

We need to prove that

BP = CQ

Proof:

In Δ BPC and Δ CQB (BP perpendicular to AC and CQ perpendicular to AB)

∠BPC = ∠CQB = 90°

∠B = ∠C (Given)

BC = BC (common)

By AAS postulate of congruent triangles

Δ BPC ≅ Δ CQB

The corresponding parts of the congruent triangles are congruent

Therefore BP = CQ

6. The perpendicular bisector of the sides of a triangle AB meet at I. Prove that: IA = IB = IC

Solution:

Given triangle ABC in which AD is the perpendicular bisector of BC

BE is the perpendicular bisector of CA

CF is the perpendicular bisector of AB

AD, BE and CF meet at I

We need to prove that

IA = IB = IC

Proof:

In ∆ BID and ∆ CID

BD = DC (given)

∠BDI = ∠CDI = 90° (AD is perpendicular bisector of BC)

BC = BC (common)

By SAS postulate of congruent triangles

∆ BID ≅ ∆ CID

The corresponding parts of the congruent triangles are congruent

Therefore IB = IC

Similarly, In ∆ CIE and ∆ AIE

CE = AE (given)

∠CEI = ∠AEI = 90° (AD is perpendicular bisector of BC)

IE = IE (common)

By SAS postulate of congruent triangles

∆ CIE ≅ ∆ ARE

The corresponding parts of the congruent triangles are congruent

Therefore IC = IA

Thus, IA = IB = IC

7. A line segment AB is bisected at point P and through point P another line segment PQ, which is perpendicular to AB, is drawn. Show that: QA = QB.

Solution:

Given triangle ABC in which AB is bisected at P

PQ is the perpendicular to AB

We need to prove that

QA = QB

Proof:

In ∆ APQ and ∆ BPQ

AP = PB (P is the midpoint of AB)

∠APQ = ∠BPQ = 90° (PQ is perpendicular to AB)

BC = BC (common)

By SAS postulate of congruent triangles

∆ APQ ≅ ∆ BPQ

The corresponding parts of the congruent triangles are congruent

Therefore QA = QB

8. If AP bisects angle BAC and M is any point on AP, prove that the perpendiculars drawn from M to AB and AC are equal.

Solution:

From M, draw ML such that ML is perpendicular to AB and MN is perpendicular to AC

In ∆ ALM and ∆ ANM

∠LAM = ∠MAN (AP is the bisector of ∠BAC)

∠ALM = ∠ANM = 90° (ML is perpendicular to AB and MN is perpendicular to AC)

AM = AM (common)

By AAS postulate of congruent triangles

∆ ALM ≅ ∆ ANM

The corresponding parts of the congruent triangles are congruent

Therefore ML = MN

Hence the proof.

9. From the given diagram, in which ABCD is a parallelogram, ABL is al line segment and E is mid-point of BC.

Prove that:

(i) ∆ DCE ≅ ∆ LBE

(ii) AB = BL.

(iii) AL = 2DC

Solution:

Given ABCD is a parallelogram in which E is the midpoint of BC

We need to prove that

(i) ∆ DCE ≅ ∆ LBE

(ii) AB = BL.

(iii) AL = 2DC

(i) In ∆ DCE and ∆ LBE

∠DCE = ∠LBE (DC parallel to AB, alternate angles)

CE = EB (E is the midpoint of BC)

∠DCE = ∠LBE (vertically opposite angles)

By ASA postulate of congruent triangles

∆ DCE ≅ ∆ LBE

The corresponding parts of the congruent triangles are congruent

Therefore DC = LB…. (i)

(ii) DC = AB…… (ii)

From (i) and (ii) AB = BL…… (iii)

(iii) AL = AB + BL……… (iv)

From (iii) and (iv) AL = AB + AB

AL = 2AB

AL = 2DC from (ii)

10. In the given figure, AB = DB and Ac = DC.

If $\angle$ABD = 58°,

$\angle$ DBC = (2x – 4)°,

$\angle$ACB = y + 15° and

$\angle$DCB = 63°; find the values of x and y.

Solution:

Given: In the given figure, AB = DB and Ac = DC.

If $\angle$ABD = 58°,

$\angle$ DBC = (2x – 4)°,

$\angle$ACB = y + 15° and

$\angle$DCB = 63°;

We need to find the values of x and y.

In Δ ABC and Δ DBC

AB = DB (given)

AC = DC (given)

BC = BC (common)

By SSS postulate of congruent triangles

Δ ABC ≅ Δ DBC

The corresponding parts of the congruent triangles are congruent

Therefore

$\angle$ACB = $\angle$DCB

y° + 15° = 63°

y° = 63° – 15°

$y^o = 48^o$

∠ACB = ∠DCB (corresponding parts of the congruent triangles)

But ∠DCB = $(2x – 4)^o$

We have ∠ACB + ∠DCB = ∠ABD

$(2x – 4)^o + (2x – 4)^o = 58^o$

$4x – 8^o = 58^o$

$4x = 58^o + 8^o$

$4x = 66^o$

$x = 66^o/4$

$x = 16.5^o$

Thus, the values of x and y are

$x = 16.5^o$ and $y = 48^o$

Exercise 9B PAGE:125

1. On the sides AB and AC of triangle ABC, equilateral triangle ABD and ACE are drawn.

Prove that:

(i) ∠CAD = ∠BAE

(ii) CD = BE.

Solution:

Given triangle ABD is an equilateral triangle

Triangle ACE is an equilateral triangle

Now, we need to prove that

(i) ∠CAD = ∠BAE

(ii) CD = BE.

Proof:

(i) ∆ ABD is equilateral

Each angle = 60^o

∠BAD = 60° ……(i)

Similarly,

∆ ACE is equilateral

Each angle = 60°

∠CAE = 60° ………..(ii)

∠BAD = ∠CAE from (i) and (ii)………..(iii)

Adding ∠BAC to both sides, we have

∠BAD + ∠BAC = ∠CAE + ∠BAC

∠CAD = ∠BAE………(iv)

(ii) In ∆ CAD and ∆ BAE

AC = AE (triangle ACE is equilateral)

∠CAD = ∠BAE from (iv)

AD = AB (triangle ABD is equilateral)

By SAS postulate of congruent triangles

∆ CAD ≅ ∆ BAE

The corresponding parts of the congruent triangles are congruent

Therefore CD = BE

Hence the proof.

2. In the following diagrams, ABCD is a square and APB is an equilateral triangle.

In each case,

(i) Prove that: ∆ APD ≅ ∆ BPC

(ii) Find the angles of ∆DPC.

Solution:

(a)

(i) Proof:

AP = PB = AB [∆ APB is an equilateral triangle]

Also we have,

$\angle PBA = \angle PAB = \angle APB = 60^o$ …….. (1)

Since ABCD is a square, we have

$\angle A = \angle B = \angle C = \angle D = 90^o$ ……….. (2)

Since $\angle DAP = \angle A - \angle PAB$ ………….. (3)

$\angle DAP = 90^o - 60^o$

$\angle DAP = 30^o$ [from equation 1 and equation 2] …………… (4)

Similarly $\angle CBP = \angle B - \angle PBA$

$\angle CBP = 90^o - 60^o$

$\angle CBP = 30^o$ [from equation 1 and equation 2] ………… (5)

$\angle DAP = \angle CBP$ [from equation 4 and equation 5] ……. (6)

Δ APD and Δ BPC

AD = BC [sides of square ABCD]

$\angle DAP = \angle CBP$ [from 6]

AP = BP [sides of equilateral triangle APB]

Therefore by SAS criteria of congruency, we have

$\Delta APD \cong \Delta BPC$

(ii) AP = PB = AB [Δ APB is an equilateral triangle] ……… (7)

AB = BC = CD = DA [sides of square ABCD] ………….. (8)

From equation 7 and 8, we have

AP = DA and PB = BC ……… (9)

In Δ APD,

AP = DA [from 9]

$\angle ADP = \angle APD$ [angles opposite to equal sides are equal]

$\angle ADP + \angle APD + \angle DAP = 180^o$ [sum of angles of a triangle = 180^o]

$\angle ADP + \angle APD + 30^o = 180^o$

$\angle ADP + \angle ADP = 180^o – 30^o$ [from 2 and from 10]

$2\ \angle ADP = 150^o$

$\angle ADP = 75^o$

We have $\angle PCD = \angle C – \angle PCB$

$\angle PCD = 90^o – 75^o$

$\angle PCD = 15^o$ ……… (13)

In triangle DPC

$\angle PDC = 15^o$

$\angle PCD = 15^o$

$\angle PCD + \angle PDC + \angle DPC = 180^o$

$\angle DPC = 180^o – 30^o$

$\angle DPC = 150^o$

Therefore angles are 15^o, 150^o and 15^o

(b)

(i) Proof: In triangle APB

AP = PB = AB

Also,

We have,

$\angle PBA = \angle PAB = \angle APB = 60^o$ ……… (1)

Since ABCD is a square, we have

$\angle A = \angle B = \angle C = \angle D = 90^o$ ………. (2)

$\angle DAP = \angle A + \angle PAB$…….. (3)

$\angle DAP = 90^o + 60^o$

$\angle DAP = 150^o$ [from 1 and 2] ……. (4)

$\angle CBP = \angle B + \angle PBA$…….. (3)

$\angle CBP = 90^o + 60^o$

$\angle CBP = 150^\circ$ [from 1 and 2] …… (5)

$\angle DAP = \angle CBP$ [from 4 and 5] …….. (6)

In triangle APD and triangle BPC

AD = BC [sides of square ABCD]

$\angle DAP = \angle CBP$ [from 6]

AP = BP [sides of equilateral triangle APB]

By SAS criteria we have

$\Delta APD \cong \Delta BPC$

(ii) AP = PB = AB [triangle APB is an equilateral triangle] ……… (7)

AB = BC = CD = DA [sides of square ABCD] ………….. (8)

From equation 7 and 8, we have

AP = DA and PB = BC ……… (9)

In Δ APD,

AP = DA [from 9]

$\angle ADP = \angle APD$ [angles opposite to equal sides are equal] ……….. (10)

$\angle ADP + \angle APD + \angle DAP = 180^\circ$ [sum of angles of a triangle = 180°]

$\angle ADP + \angle APD + 150^\circ = 180^\circ$

$\angle ADP + \angle ADP = 180^\circ - 150^\circ$ [from 2 and from 10]

$2\ \angle ADP = 30^\circ$

$\angle ADP = 15^\circ$

We have $\angle PCD = \angle D - \angle ADP$

$\angle PCD = 90^\circ - 15^\circ$

$\angle PCD = 75^\circ$ ……… (11)

In triangle BPC

PB = BC [from 9]

$\angle PCB = \angle BPC$ ……… (12)

∠PCB + ∠BPC + ∠CPB = 180°

∠PCB + ∠PCB = 180° – 150° [from 2 and from 10]

2 ∠PCB = 30°

∠PCB = 15°

We have ∠PCD = ∠C – ∠PCB

∠PCD = 90° – 15°

∠PCD = 75° ……… (11)

In triangle DPC

∠PDC = 75°

∠PCD = 75°

∠PCD + ∠PDC + ∠DPC = 180°

75° + 75° + ∠DPC = 180°

∠DPC = 180° – 150°

∠DPC = 30°

Angles of triangle are 75°, 30° and 75°

3. In the figure, given below, triangle ABC is right-angled at B. ABPQ and ACRS are squares. Prove that:

(i) ∆ACQ and ∆ASB are congruent.

(ii) CQ = BS.

Solution:

Triangle ABC is right-angled at B.

ABPQ and ACRS are squares.

We need to prove that:

(i) ∆ACQ and ∆ASB are congruent.

(ii) CQ = BS.

Proof:

(i) ∠QAB = 90° (ABPQ is a square) …. (1)

∠SAC = 90º (ACRS is a square) ………. (2)

From (1) and (2) we have

∠QAB = ∠SAC ………… (3)

Adding ∠BAC both sides of (3) we get

∠QAB + ∠BAC = ∠SAC + ∠BAC

∠QAC = ∠SAB ………. (4)

In ∆ ACQ and ∆ ASB

QA = QB (sides of a square ABPQ)

∠CAD = ∠BAE from (iv)

AC = AS (side of a square ACRS)

By AAS postulate of congruent triangles

Therefore ∆ ACQ ≅ ∆ ASB

(ii)The corresponding parts of the congruent triangles are congruent

Therefore CQ = BS

4. In a ∆ABC, BD is the median to the side AC, BD is produced to E such that BD = DE. Prove that: AE is parallel to BC.

Solution:

Given in a ∆ABC, BD is the median to the side AC,

BD is produced to E such that BD = DE.

Now we have to prove that: AE is parallel to BC.

Construction: Join AE

Proof:

AD = DC (BD is median to AC)

In ∆ BDC and ∆ ADE

BD = DE (Given)

∠BDC = ∠ADE = 90º (vertically opposite angles)

AD = DC (from 1)

By SAS postulate of congruent triangles

Therefore ∆ BDC ≅ ∆ ADE

The corresponding parts of the congruent triangles are congruent

∠BDC = ∠ADE

But these are alternate angles

And AC is the transversal

Thus, AE parallel to BC

5. In the adjoining figure, OX and RX are the bisectors of the angles Q and R respectively of the triangle PQR.

If XS ⊥ QR and XT ⊥ PQ; prove that:

(i) ∆ XTQ ≅ ∆ XSQ

(ii) PX bisects angle ∠P.

Solution:

In the adjoining figure,

OX and RX are the bisectors of the angles Q and R respectively of the triangle PQR.

If XS ⊥ QR and XT ⊥ PQ;

We have to prove that:

(i) ∆ XTQ ≅ ∆ XSQ

(ii) PX bisects angle ∠P.

Construction:

Draw If XZ⊥ PR and join PX

Proof:

(i) In ∆ XTQ and ∆ XSQ

∠QTX = ∠QSX = 90° (XS perpendicular to QR and XT perpendicular to PQ)

∠QTX = ∠QSX (QX is bisector of angle Q)

QX = QX (common)

By AAS postulate of congruent triangles

Therefore ∆ XTQ ≅ ∆ XSQ ………….. (1)

(ii) The corresponding parts of the congruent triangles are congruent

Therefore XT = XS (by c.p.c.t)

In ∆ XSR and ∆ XZR

∠XSR = ∠XZR = 90° (XS perpendicular to XS and angle XSR = 90°)

∠SRX = ∠ZRX (RX is a bisector of angle R)

RX = RX (common)

By AAS postulate of congruent triangles

Therefore ∆ XSR ≅ ∆ XZR ………….. (1)

The corresponding parts of the congruent triangles are congruent

Therefore XS = XZ (by c.p.c.t) ……….. (2)

From (1) and (2)

XT = XZ …………… (3)

In ∆ XTP and ∆ XZP

∠XTP = ∠XZP = 90° (Given)

XP = XP (common)

XT = XZ (from 3)

By right angle hypotenuse side postulate of congruent triangles

Therefore ∆ XTP ≅ ∆ XZP

The corresponding parts of the congruent triangles are congruent

∠XPT = ∠XPZ

PX bisects ∠SRX = ∠P

6. In the parallelogram ABCD, the angles A and C are obtuse. Points X and Y are taken on the diagonal BD such that the angles XAD and YCB are right angles.

Prove that: XA = YC.

Solution:

ABCD is a parallelogram in which ∠A and ∠C are obtuse.

Points X and Y are on the diagonal BD

Such that ∠XAD = ∠YCB = 90°

We need to prove that XA = YC

Proof:

In Δ XAD and Δ YCB

∠XAD = ∠YCB = 90° (Given)

AD = BC (opposite sides of a parallelogram)

∠ADX = ∠CBY (alternate angles)

By ASA postulate of congruent triangles

Therefore Δ XAD ≅ Δ YCB

The corresponding parts of the congruent triangles are congruent

Therefore XA = YC

Hence the proof.

7. ABCD is a parallelogram. The sides AB and AD are produced to E and F respectively, such produced to E and F respectively, such that AB = BE and AD = DF.

Prove that: Δ BEC ≅ Δ DCF

Solution:

ABCD is a parallelogram.

The sides AB and AD are produced to E and F respectively,

Such that AB = BE and AD = DF.

We need to prove that Δ BEC ≅ Δ DCF

Proof:

AB = DC (opposite sides of a parallelogram) ……. (1)

AB = BE (given) ……….. (2)

From (1) and (2) we have

BE = DC (opposite sides of a parallelogram) ………. (3)

AD = BC (opposite sides of a parallelogram) …….. (4)

AD = DF (given) ………… (5)

From (4) and (5) we have

BC = DF ……… (6)

Since AD parallel to BC the corresponding angles are equal

∠DAB = ∠CBE …….. (7)

Since AD parallel to DC the corresponding angles are equal

∠DAB = ∠FDC ……… (8)

From (7) and (8)

∠CBE = ∠FDC …….. (9)

In ∆ BEC and ∆ DCF

BE = DC (from (3))

∠CBE = ∠FDC (from (9))

BC = DF (from (6))

By SAS postulate of congruent triangles

Therefore ∆ BEC ≅ ∆ DCF

Hence the proof.

8. In the following figures, the sides AB and BC and the median AD of triangle ABC are equal to the sides PQ and QR and median PS of the triangle PQR. Prove that ∆ABC and ∆PQR are congruent.

Solution:

Since BC = QR

We have BD = QS and DC = SR (D is the midpoint of BC and S is the midpoint of QR)

In ∆ ABD and ∆ PQS

AB = PQ ……… (1)

AD = PS ………. (2)

BD = QS ……….. (3)

By SSS postulate of congruent triangles

Therefore ∆ ABD ≅ ∆ PQS

Similarly

In ∆ ADC and ∆ PSR

AD = PS ……….. (4)

AC = PR ……….. (5)

DC = SR ………. (6)

By SSS postulate of congruent triangles

Therefore ∆ ADC ≅ ∆ PSR

We have

BC = BD + DC (D is the midpoint of BC)

= QS + SR (from (3) and (6))

= QR (S is the midpoint of QR) ……… (7)

Now again consider the triangles ∆ ABC and ∆ PR

AB = PQ (from 1)

BC = QR (from 7)

AC = PR (from 7)

By SSS postulate of congruent triangles

Therefore ∆ ABC ≅ ∆ PQR

Hence the proof.

9. In the following diagram, AP and BQ are equal and parallel to each other.

Prove that

(i) ∆ AOP ≅ ∆ BOQ

(ii) AB and PQ bisect each other

Solution:

In the figure AP and BQ are equal and parallel to each other

Therefore AP = BQ and AP parallel to BQ

We need to prove that

(i) Δ AOP ≅ Δ BOQ

(ii) AB and PQ bisect each other

(i) since AP parallel to BQ

∠APO = ∠BQO (alternate angles) …….. (1)

And ∠PAO = ∠QBO (alternate angles) …….. (2)

Now in Δ AOP and Δ BOQ

∠APO = ∠BQO (from 1)

AP = PQ (given)

∠PAO = ∠QBO (from 2)

By ASA postulate of congruent triangles,

Δ AOP ≅ Δ BOQ

(ii) the corresponding parts of the congruent triangles are congruent

Therefore OP = OQ (by c.p.c.t)

OA = OB (by c.p.c.t)

Hence AB and PQ bisect each other

10. In the following figure, OA = OC and AB = BC.

(i) ∠P= 90°

(ii) Δ AOD ≅ Δ COD

Solution:

Given OA = OC and AB = BC.

Now we have to prove that,

(i) ∠P= 90°

(ii) Δ AOD ≅ Δ COD

(iii) AD = CD

(i) In Δ ABO and Δ CBO

AB = BC (given)

AO = CO (given)

OB = OB (common)

By SSS postulate of congruent triangles

Therefore Δ ABO ≅ Δ CBO

The corresponding parts of the congruent triangles are congruent

$\angle$ABO = $\angle$CBO (by c.p.c.t)Hence$\angle$ABD = $\angle$CBD

$\angle$AOB = $\angle$CBO (by c.p.c.t)

We have $\angle$ABO + $\angle$CBO = 180^o (linear pair)

$\angle$ABO = $\angle$CBO = 90^o

And AC perpendicular to BD

(ii) In Δ AOD and Δ COD

OD = OD (common)

$\angle$AOD = $\angle$COD (each = 90^o)

AO = CO (given)

By SAS postulate of congruent triangles

Therefore Δ AOD ≅ Δ COD

(iii) The corresponding parts of the congruent triangles are congruent

Therefore AD = CD (by c.p.c.t)

Hence the proof.

Benefits of ICSE Class 9 Maths Selina Solutions Chapter 9

Using the ICSE Class 9 Maths Selina Solutions for Chapter 9 on Triangles offers several benefits for students:

Clear Understanding of Concepts: The ICSE Class 9 Maths Selina Solutions Chapter 9 provide step-by-step explanations of problems, helping students grasp the underlying concepts of triangle properties, congruence criteria, and theorems.

Enhanced Problem-Solving Skills: By working through a variety of problems and seeing the ICSE Class 9 Maths Selina Solutions Chapter 9, students can improve their problem-solving skills and learn different approaches to tackle similar questions.

Preparation for Exams: The ICSE Class 9 Maths Selina Solutions Chapter 9 help students practice and understand the types of questions that may appear in exams, thus boosting their confidence and readiness for tests.

Clarification of Doubts: Students can use the ICSE Class 9 Maths Selina Solutions Chapter 9 to clarify any doubts they have about specific problems or concepts, ensuring they have a solid understanding before moving on to more complex topics.

Reinforcement of Learning: Regularly reviewing solved problems reinforces learning and helps in retaining key concepts and theorems related to triangles.