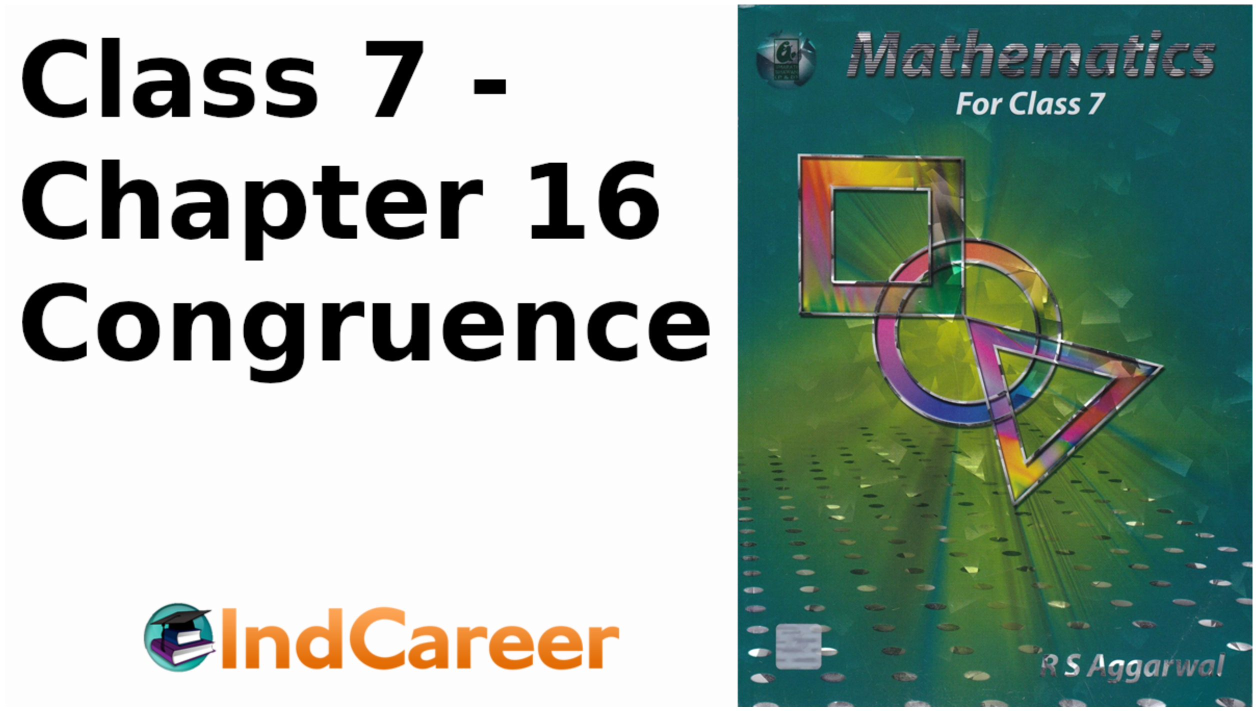
# RS Aggarwal Solutions for Class 7 Maths Chapter 16–Congruence

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# RS Aggarwal Solutions for Class 7 Maths Chapter 16–Congruence

Class 7: Maths Chapter 16 solutions. Complete Class 7 Maths Chapter 16 Notes.

## RS Aggarwal Solutions for Class 7 Maths Chapter 16–Congruence

RS Aggarwal 7th Maths Chapter 16, Class 7 Maths Chapter 16 solutions

**Question 1.**

**Solution:**

(i) ∆ABC ≅ ∆EFD, Then

A ↔ E, B ↔ F and C ↔ D

AB = EF, BC = FD and CA = DE

∠A = ∠E, ∠B = ∠F and ∠C = ∠D

(ii) ∆CAB ≅ ∆QRP

C ↔ Q, A ↔ R and B ↔ P

CA = QR, AB = RP and BC = PQ

∠C = ∠Q, ∠A = ∠R and ∠B = ∠P

(iii) ∆XZY ≅ ∆QPR

X ↔ Q, Z ↔ P, Y ↔ R

XZ = QP, ZY = PR and YX = RQ

∠X = ∠Q, ∠Z = ∠P and ∠Y = ∠R

(iv) ΔMPN ≅ ΔSQR

M ↔ S, P ↔ Q and N ↔ R

MP = SQ, PN = QR and NM = RS

∠M = ∠S, ∠P = ∠Q and ∠N = ∠R.

**Question 2.**

**Solution:**

(i) In fig (i)

In ΔABC and ΔDEF

∠C = ∠E

CA = ED

CB = EF

ΔACB ≅ ΔDEF (SAS condition)

(ii) In fig (ii)

In ΔRPQ and ΔLNM

Side PQ = NM

Hyp. RQ = LM

ΔRPQ ≅ ΔLNM (RHS condition)

(iii) In ΔYXZ and ΔTRS

XY = RT

∠X = SR and YZ = TS

$\Delta YXZ \cong \Delta TRS$ (SSS condition)

(iv) In $\Delta DEF$ and $\Delta PNM$

$\angle E = \angle N$

$\angle F = \angle M$

EF = NM

$\Delta DEF \cong \Delta PNM$ (ASA condition)

(v) In $\Delta ABC$ and $\Delta ADC$

AC = AC (common)

$\angle$ CAB = $\angle$ CAD (each 50°)

$\angle$ ACB = $\angle$ DCA (each 60°)

$\Delta ABC \cong \Delta ADC$ (ASA condition)

**Question 3.**

**Solution:**

In fig,

PL $\perp$ OA and PM $\perp$ OB and PL = PM

Now in right $\Delta PLO$ and $\Delta PMO$,

Side PL = PM (given)

Hypotenuse OP = OP (common)

$\Delta PLO \cong \Delta PMO$ (RHS condition)

Yes $\Delta PLO \cong \Delta PMO$

Hence proved.

**Question 4.**

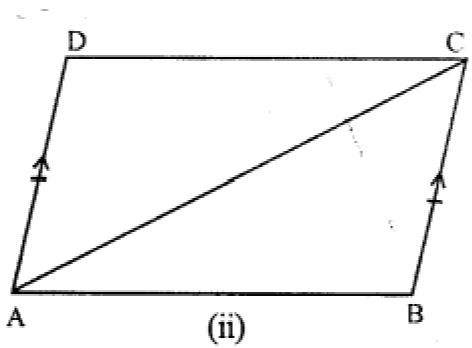
**Solution:**

In the figure,

AD = BC and AD || BC.

In ∆ABC and ∆ADC,

AC = AC (common)




BC = AB (given)

∠ACB = ∠CAD (Alternate angles)

∆ABC ≅ ∆ADC (SAS condition)

AB = DC (c.p.c.t)

Hence proved.

**Question 5.**

**Solution:**

In ∆ABD and ∆ACD,

AD = AD (common)

AB = AC (given)

BD = CD (given)

ΔABD ≅ ΔADC (SSS condition)

∠BAD = ∠CAD (c.p.c.t.)

and ∠ADB = ∠ADC (c.p.c.t.)

But ∠ADB + ∠ADC = 180° (Linear pair)

∠ADB = ∠ADC = 90°

Hence proved.

**Question 6.**

**Solution:**

given : In ΔABC, AD is the bisector of ∠A i.e. ∠BAD = ∠CAD

AD ⊥ BC.

To prove : ΔABC is an isosceles

Proof : In ΔADB and ΔADC.

AD = AD (common)

∠ BAD = ∠ CAD (AD is the bisector of ∠A)

∠ ADB = ∠ ADC (each = 90°, AD ⊥ BC)

ΔADM ≅ ΔADC (ASA condition)

AB = AC (c.p.c.t)

Hence ΔABC is an isosceles triangle.

Hence proved.

**Question 7.**

**Solution:**

In the figure,

AB = AD, CB = CD

To prove : ∆ABC ≅ ∆ADC

Proof : In ∆ABC and ∆ADC

AC = AC (common)

AB = AD (given)

CB = CD (given)

∆ABC ≅ ∆ADC (SSS condition)

Hence proved.

**Question 8.**

**Solution:**

Given : In the figure,

PA ⊥ AB, QB ⊥ AB and PA = QB.

To prove : ∆OAP ≅ ∆OBQ,

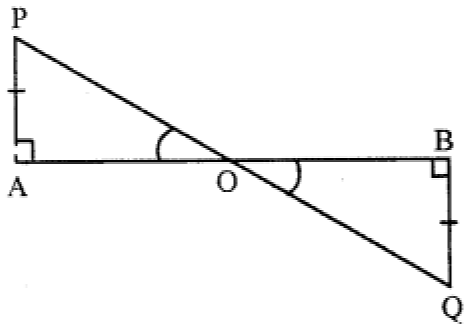
Is OA = QB ?

Proof : In ∆OAP and ∆OBQ,

∠ A = ∠ B (each 90°)

AP = BQ (given)

∠AOP = ∠BOQ (vertically opposite angles)




ΔOAP ≅ ΔOBQ (AAS condition)

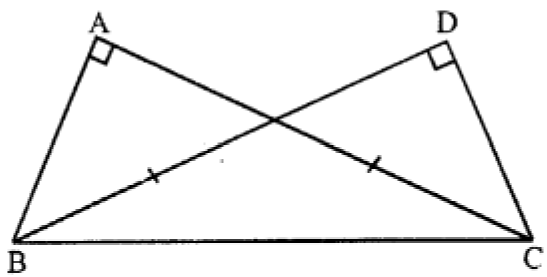
OA = OB (c.p.c.t.)

Hence proved.

**Question 9.**

**Solution:**

Given : In right triangles ABC and DCB right angled at A and D respectively and AC = DB




To prove : ΔABC ≅ ΔDCB.

Proof: In right angled ΔABC and ΔDCB,

Hypotenuse BC = BC (common)

side AC = DB (given)

∆ABC ≅ ∆DCB (RHS condition)

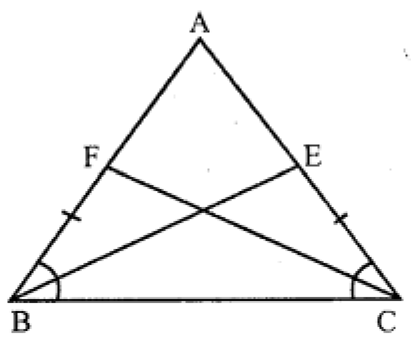
Hence proved.

**Question 10.**

**Solution:**

Given: ∆ABC is an isosceles triangle in which AB = AC.

E and F are the midpoints of AC and AB respectively.




To prove : BE = CF

Proof : In ∆BCF and ∆CBE,

BC = BC (common)

BF = CE (Half of equal sides AB and AC)

∠CBF = ∠BCF (Angles opposite to equal sides)

∆BCF ≅ ∆CBE (SAS condition)

CF = BE (c.p.c.t.)

or BE = CF

Hence proved.

**Question 11.**

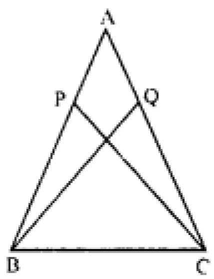
**Solution:**

Given : In isosceles ∆ABC,

AB = AC.

P and Q are the points on AB and AC respectively such that AP = AQ.

To prove : BQ = CP




Proof : In ∆ABQ and ∆ACP,

AB = AC (given)

AQ = AP (given)

∠ A = ∠ A (common)

∆ABQ ≅ ∆ACP (SAS condition)

BQ = CP (c.p.c.t.)

Hence proved.

**Question 12.**

**Solution:**

Given : ∆ABC is an isosceles triangle in which AB = AC.

AB and AC are produced to D and E respectively such that BD = CE.

BE and CD are joined.

To prove : BE = CD.

Proof : AB = AC and BD = CE

Adding we get:

AB + BD = AC + CE

AD = AE

Now, in ∆ACD and ∆ABE

AC = AB (given)

AD = AE (proved)

∠ A = ∠ A (common)

∆ACD ≅ ∆ABE (SSA condition)

CD = BE (c.p.c.t.)

Hence, BE = CD.

**Question 13.**

**Solution:**

Given : In ∆ABC,

AB = AC.

D is a point such that BD = CD.

AD, BD and CD are joined.

To prove : AD bisects ∠A and ∠D.

Proof : In ∆ABD and ∆CAD,

AD = AD (common)

AB = AC (given)

BD = CD (given)

∆ABD ≅ ∆CAD (SSS condition)

∠BAD = ∠CAD (c.p.c.t.)

and ∠BDA = ∠CDA (c.p.c.t.)

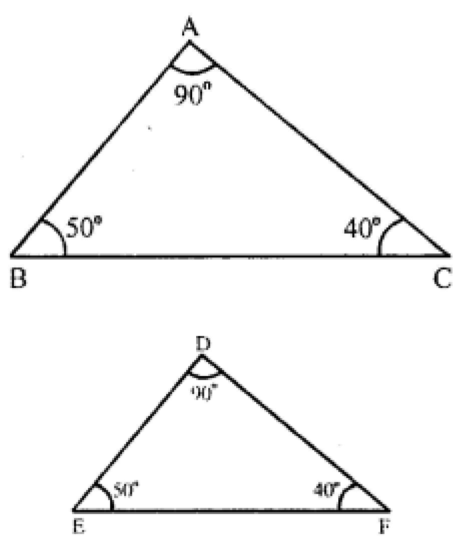
Hence AD is the bisector of ∠A and Z D.

Hence proved.

**Question 14.**

**Solution:**

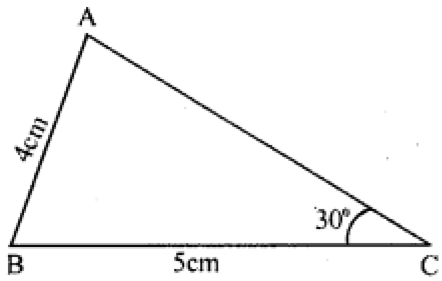
Two triangles whose corresponding angles are equal, it is not necessarily that they should be congruent. It is possible if atleast one side must be equal. Below given a pair of triangles whose angles are equal but these are not congruent.

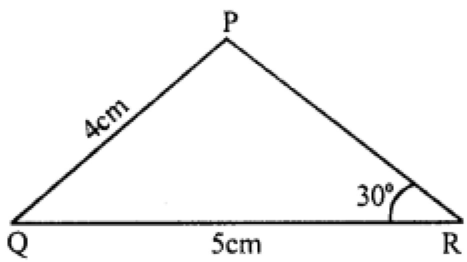



**Question 15.**

**Solution:**

In two triangles, if two sides and and included angle of the one equal to the corresponding two sides and included angle, then the two triangles are congruent.



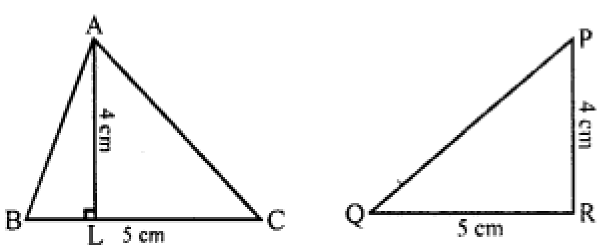




If another angle except included angles are equal to each other and two sides are also equal these are not congruent. In the above figures, in ΔABC and ΔPQR, two corresponding sides and one angle are equal, but these are not congruent.

**Question 16.**

**Solution:**

In ΔABC,



Area = 12 x BC x AL = 12 x 5 x 4 = 10 cm²

and in ∆PQR

Area = 12 x QR x PR = 12 x 5 x 4 = 10 cm²

In these triangles

Areas of both triangles are equal but are not congruent to each other

**Question 17.**

**Solution:**

(i) Two line segments are congruent if they have the same length.

(ii) Two angles are congruent if they have equal measure.

(iii) Two squares are congruent if they have same side length.

(iv) Two circles are congruent if they have equal radius.

(v) Two rectangles are congruent if they have the same length and same breadth.

(vi) Two triangles are congruent if they have all parts equal.

**Question 18.**

**Solution:**

(i) False : Only those squares are congruent which have the same side.

(ii) True :

(iii) False : It is not necessarily, that those figures which have equal areas, must be congruent.

(iv) False : It is not necessarily that those triangles whose areas are equal, must be congruent.

(v) False : It is not necessarily that such triangles must be congruent.

(vi) True : It two angles and one side of a triangle are equal to the corresponding two angles and one side of the other are equal they are congruent.

(vii) False : Only three angles of one are equal the three angles of is not necessarily that these must be congruent.

(viii) True.

(ix) False : Only hypotenuse and one right angle of the one are equal to the hypotenuse and one right angles of the other, the triangles are not necessarily congruent, one side except them, must be equal.

(x) True : It is the definition of congruency of two triangles.

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He was born on January 2, 1946 in a village of Delhi. He graduated from Kirori Mal College, University of Delhi. After completing his M.Sc. in Mathematics in 1969, he joined N.A.S. College, Meerut, as a lecturer. In 1976, he was awarded a fellowship for 3 years and joined the University of Delhi for his Ph.D. Thereafter, he was promoted as a reader in N.A.S. College, Meerut. In 1999, he joined M.M.H. College, Ghaziabad, as a reader and took voluntary retirement in 2003. He has authored more than 75 titles ranging from Nursery to M. Sc. He has also written books for competitive examinations right from the clerical grade to the I.A.S. level.

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