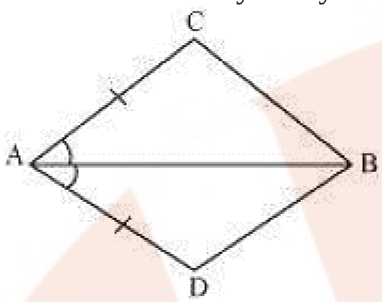
# Exercise (7.1)

## Question 1:
In quadrilateral ACBD, AC = AD and AB bisects ∠A (See the given figure). Show that ΔABC ≅ ΔABD. What can you say about BC and BD?




## Solution 1:
In ΔABC and ΔABD,
AC = AD (Given)
∠CAB = ∠DAB (AB bisects ∠A)
AB = AB (Common)
∴ ΔABC ≅ ΔABD (By SAS congruence rule)
∴ BC = BD (By CPCT)
Therefore, BC and BD are of equal lengths.

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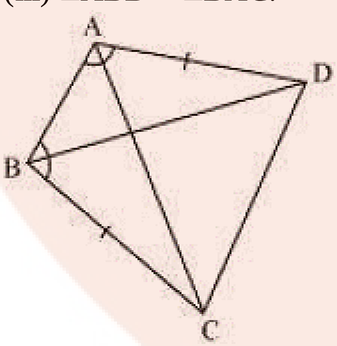
## Question 2:
ABCD is a quadrilateral in which AD = BC and ∠DAB = ∠CBA (See the given figure). Prove that
(i) ΔABD ≅ ΔBAC
(ii) BD = AC
(iii) ∠ABD = ∠BAC.




## Solution 2:
In ΔABD and ΔBAC,
AD = BC (Given)
∠DAB = ∠CBA (Given)
AB = BA (Common)
∴ ΔABD ≅ ΔBAC (By SAS congruence rule)

∴ BD = AC (By CPCT)
And, ∠ABD = ∠BAC (By CPCT)

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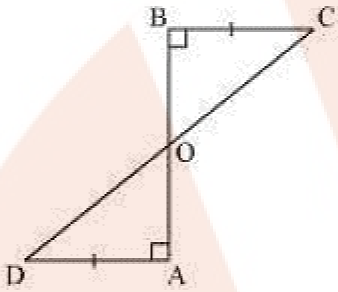
**Question 3:**
AD and BC are equal perpendiculars to a line segment AB (See the given figure). Show that CD bisects AB.




**Solution 3:**
In ΔBOC and ΔAOD,
∠BOC = ∠AOD (Vertically opposite angles)
∠CBO = ∠DAO (Each 90º)
BC = AD (Given)
∴ ΔBOC ≅ ΔAOD (AAS congruence rule)
∴ BO = AO (By CPCT)
⇒ CD bisects AB.

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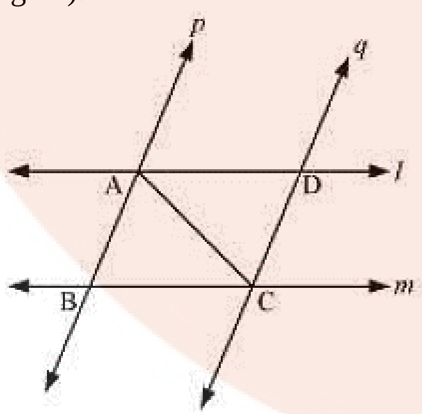
**Question 4:**
l and m are two parallel lines intersected by another pair of parallel lines p and q (see the given figure). Show that ΔABC ≅ ΔCDA.




**Solution 4:**
In ΔABC and ΔCDA,
∠BAC = ∠DCA (Alternate interior angles, as *p* || *q*)

AC = CA (Common)
∠BCA = ∠DAC (Alternate interior angles, as $l \parallel m$)
∴ ΔABC ≅ ΔCDA (By ASA congruence rule)

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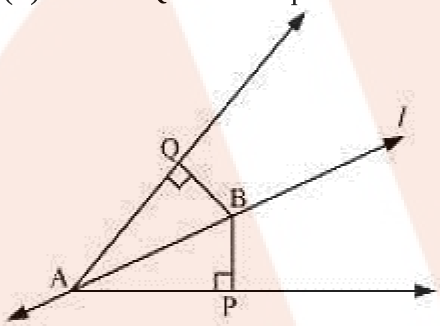
**Question 5:**
Line $l$ is the bisector of an angle ∠A and B is any point on $l$. BP and BQ are perpendiculars from B to the arms of ∠A (see the given figure). Show that:
(i) ΔAPB ≅ ΔAQB
(ii) BP = BQ or B is equidistant from the arms of ∠A.




**Solution 5:**
In ΔAPB and ΔAQB,
∠APB = ∠AQB (Each 90º)
∠PAB = ∠QAB ($l$ is the angle bisector of ∠A)
AB = AB (Common)
∴ ΔAPB ≅ ΔAQB (By AAS congruence rule)
∴ BP = BQ (By CPCT)
Or, it can be said that B is equidistant from the arms of ∠A.

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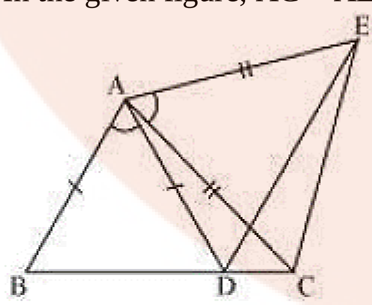
**Question 6:**
In the given figure, AC = AE, AB = AD and ∠BAD = ∠EAC. Show that BC = DE.




**Solution 6:**
It is given that ∠BAD = ∠EAC
∠BAD + ∠DAC = ∠EAC + ∠DAC

∠BAC = ∠DAE

In ΔBAC and ΔDAE,
AB = AD (Given)
∠BAC = ∠DAE (Proved above)
AC = AE (Given)

∴ ΔBAC ≅ ΔDAE (By SAS congruence rule)
∴ BC = DE (By CPCT)

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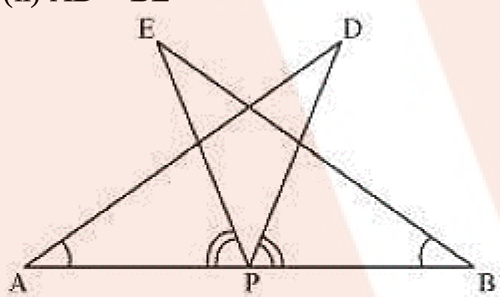
**Question 7:**
AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that ∠BAD = ∠ABE and ∠EPA = ∠DPB (See the given figure). Show that
(i) ΔDAP ≅ ΔEBP
(ii) AD = BE




**Solution 7:**
It is given that ∠EPA = ∠DPB
∠EPA + ∠DPE = ∠DPB + ∠DPE
∴ ∠DPA = ∠EPB
In ΔDAP and ΔEBP,
∠DAP = ∠EBP (Given)
AP = BP (P is mid-point of AB)
∠DPA = ∠EPB (From above)
∴ ΔDAP ≅ ΔEBP (ASA congruence rule)
∴ AD = BE (By CPCT)

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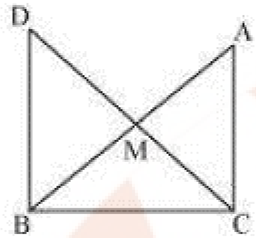
**Question 8:**
In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that DM = CM. Point D is joined to point B (see the given figure). Show that:
(i) ΔAMC ≅ ΔBMD
(ii) ∠DBC is a right angle.

(iii) $\Delta DBC \cong \Delta ACB$

(iv) $CM = \frac{1}{2} AB$




**Solution 8:**

(i) In $\Delta AMC$ and $\Delta BMD$,
AM = BM (M is the mid-point of AB)
$\angle AMC = \angle BMD$ (Vertically opposite angles)
CM = DM (Given)
$\therefore \Delta AMC \cong \Delta BMD$ (By SAS congruence rule)
$\therefore$ AC = BD (By CPCT)
And, $\angle ACM = \angle BDM$ (By CPCT)

(ii) $\angle ACM = \angle BDM$
However, $\angle ACM$ and $\angle BDM$ are alternate interior angles.
Since alternate angles are equal,
It can be said that DB || AC
$\angle DBC + \angle ACB = 180^\circ$ (Co-interior angles)
$\angle DBC + 90^\circ = 180^\circ$
$\therefore \angle DBC = 90^\circ$

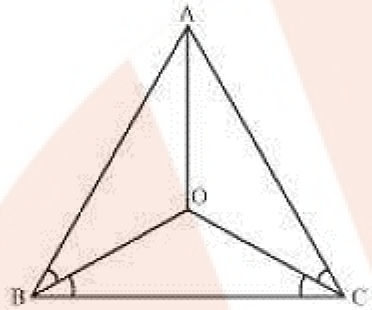
(iii) In $\Delta DBC$ and $\Delta ACB$,
DB = AC (Already proved)
$\angle DBC = \angle ACB$ (Each 90 )
BC = CB (Common)
$\therefore \Delta DBC \cong \Delta ACB$ (SAS congruence rule)

(iv) $\Delta DBC \cong \Delta ACB$
AB = DC (By CPCT)
AB = 2 CM
$\therefore CM = \frac{1}{2} AB$

# Exercise (7.2)

**Question 1:**
In an isosceles triangle ABC, with AB = AC, the bisectors of ∠B and ∠C intersect each other at O. Join A to O. Show that:
(i) OB = OC (ii) AO bisects ∠A

**Solution 1:**




(i) It is given that in triangle ABC, AB = AC
∠ACB = ∠ABC (Angles opposite to equal sides of a triangle are equal)
$\frac{1}{2}\angle ACB = \frac{1}{2}\angle ABC$
∠OCB = ∠OBC
∴ OB = OC (Sides opposite to equal angles of a triangle are also equal)

(ii) In ΔOAB and ΔOAC,
AO =AO (Common)
AB = AC (Given)
OB = OC (Proved above)

Therefore, ΔOAB ≅ ΔOAC (By SSS congruence rule)
∠BAO = ∠CAO (CPCT)
∴ AO bisects ∠A.

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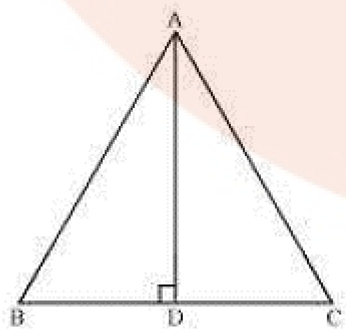
**Question 2:**
In ΔABC, AD is the perpendicular bisector of BC (see the given figure). Show that ΔABC is an isosceles triangle in which AB = AC.



**Solution 2:**

In ΔADC and ΔADB,

AD = AD (Common)

∠ADC =∠ADB (Each 90º)

CD = BD (AD is the perpendicular bisector of BC)

∴ ΔADC ≅ ΔADB (By SAS congruence rule)

∴ AB = AC (By CPCT)

Therefore, ABC is an isosceles triangle in which AB = AC.

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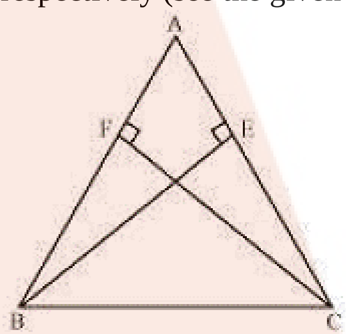
**Question 3:**

ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB respectively (see the given figure). Show that these altitudes are equal.




**Solution 3:**

In ΔAEB and ΔAFC,

∠AEB and ∠AFC (Each 90º)

∠A = ∠A (Common angle)

AB = AC (Given)

∴ ΔAEB ≅ ΔAFC (By AAS congruence rule)

∴ BE = CF (By CPCT)

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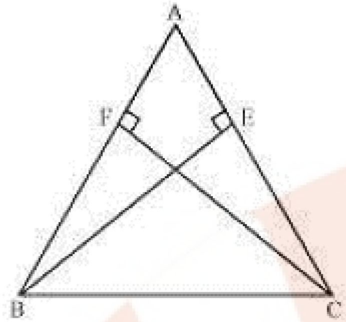
**Question 4:**

ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal (see the given figure). Show that

(i) ΔABE ≅ ΔACF

(ii) AB = AC, i.e., ABC is an isosceles triangle.




**Solution 4:**

(i) In ΔABE and ΔACF,

∠ABE and ∠ACF (Each 90º)

∠A = ∠A (Common angle)

BE = CF (Given)

∴ ΔABE ≅ ΔACF (By AAS congruence rule)

(ii) It has already been proved that

ΔABE ≅ ΔACF

∴ AB = AC (By CPCT)

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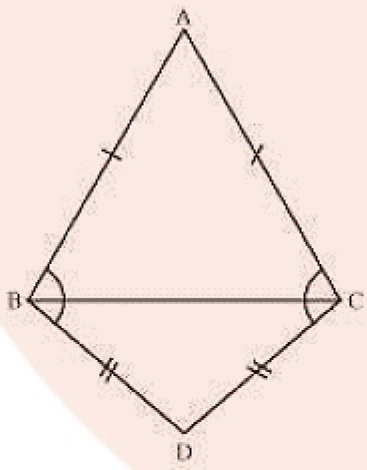
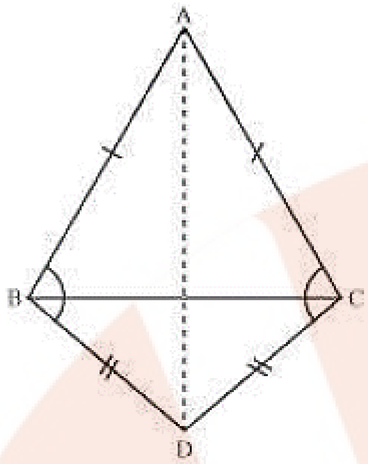
**Question 5:**

ABC and DBC are two isosceles triangles on the same base BC (see the given figure). Show that ∠ABD = ∠ACD.




**Solution 5:**




Let us join AD.
In ΔABD and ΔACD,
AB = AC (Given)
BD = CD (Given)
AD = AD (Common side)
∴ ΔABD ≅ ΔACD (By SSS congruence rule)
∴ ∠ABD = ∠ACD (By CPCT)

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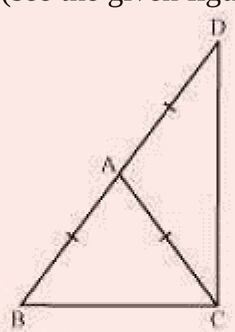
**Question 6:**
ΔABC is an isosceles triangle in which AB = AC. Side BA is produced to D such that AD = AB (see the given figure). Show that ∠BCD is a right angle.




**Solution 6:**
In ΔABC,
AB = AC (Given)
∴ ∠ACB = ∠ABC (Angles opposite to equal sides of a triangle are also equal)

In ΔACD,
AC = AD
∴ ∠ADC = ∠ACD (Angles opposite to equal sides of a triangle are also equal)

In ΔBCD,

$\angle ABC + \angle BCD + \angle ADC = 180^\circ$ (Angle sum property of a triangle)
$\angle ACB + \angle ACB + \angle ACD + \angle ACD = 180^\circ$
$2(\angle ACB + \angle ACD) = 180^\circ$
$2(\angle BCD) = 180^\circ$
$\therefore \angle BCD = 90^\circ$

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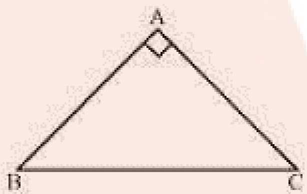
**Question 7:**
ABC is a right angled triangle in which $\angle A = 90^\circ$ and AB = AC. Find $\angle B$ and $\angle C$.

**Solution 7:**




It is given that
AB = AC
$\therefore \angle C = \angle B$ (Angles opposite to equal sides are also equal)

In $\Delta ABC$,
$\angle A + \angle B + \angle C = 180^\circ$ (Angle sum property of a triangle)
$90^\circ + \angle B + \angle C = 180^\circ$
$90^\circ + \angle B + \angle B = 180^\circ$
$2\angle B = 90^\circ$
$\angle B = 45^\circ$
$\therefore \angle B = \angle C = 45^\circ$

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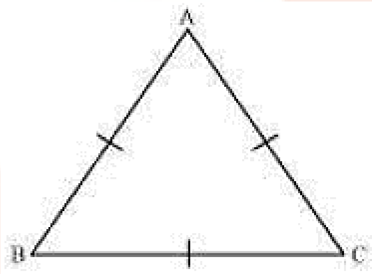
**Question 8:**

Show that the angles of an equilateral triangle are 60º each.

**Solution 8 :**




Let us consider that ABC is an equilateral triangle.

Therefore, AB = BC = AC

AB = AC

∴ ∠C = ∠B (Angles opposite to equal sides of a triangle are equal)

Also,

AC = BC

∴ ∠B = ∠A (Angles opposite to equal sides of a triangle are equal)

Therefore, we obtain

∠A = ∠B = ∠C

In ΔABC,

∠A + ∠B + ∠C = 180°

∠A + ∠A + ∠A = 180°

3∠A = 180°

∠A = 60°

∴ ∠A = ∠B = ∠C = 60°

Hence, in an equilateral triangle, all interior angles are of measure 60º.

# Exercise (7.3)

**Question 1:**

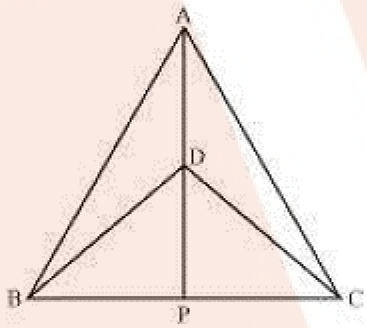
ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (see the given figure). If AD is extended to intersect BC at P, show that

(i) ΔABD ≅ ΔACD

(ii) ΔABP ≅ ΔACP

(iii) AP bisects ∠A as well as ∠D.

(iv) AP is the perpendicular bisector of BC.




**Solution 1:**

(i) In ΔABD and ΔACD,

AB = AC (Given)

BD = CD (Given)

AD = AD (Common)

ΔABD ≅ ΔACD (By SSS congruence rule)

∠BAD = ∠CAD (By CPCT)

∠BAP = ∠CAP …. (1)

(ii) In ΔABP and ΔACP,

AB = AC (Given)

∠BAP = ∠CAP [From equation (1)]

AP = AP (Common)

∴ ΔABP ≅ ΔACP (By SAS congruence rule)

∴ BP = CP (By CPCT) … (2)

(iii) From Equation (1),

$\angle BAP = \angle CAP$

Hence, AP bisects $\angle A$.

In $\Delta BDP$ and $\Delta CDP$,

BD = CD (Given)

DP = DP (Common)

BP = CP [From equation (2)]

$\therefore \Delta BDP \cong \Delta CDP$ (By SSS Congruence rule)

$\therefore \angle BDP = \angle CDP$ (By CPCT) … (3)

Hence, AP bisects $\angle D$.

(iv) $\Delta BDP \cong \Delta CDP$

$\therefore \angle BPD = \angle CPD$ (By CPCT) …. (4)

$\angle BPD + \angle CPD = 180^o$ (Linear pair angles)

$\angle BPD + \angle BPD = 180^o$

$2\angle BPD = 180^o$ [From Equation (4)]

$\angle BPD = 90^o$ … (5)

From Equations (2) and (5), it can be said that AP is the perpendicular bisector of BC.

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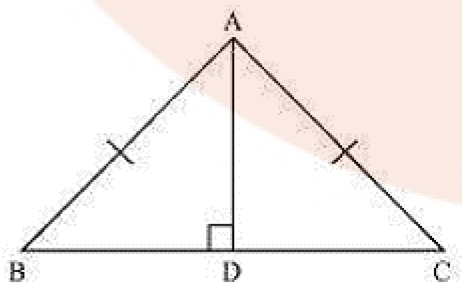
## Question 2:

AD is an altitude of an isosceles triangles ABC in which AB = AC. Show that

(i) AD bisects BC (ii) AD bisects $\angle A$.

## Solution 2:



(i) In $\Delta BAD$ and $\Delta CAD$,

$\angle ADB = \angle ADC$ (Each $90^\circ$ as AD is an altitude)

AB = AC (Given)

AD = AD (Common)

$\therefore \Delta BAD \cong \Delta CAD$ (By RHS Congruence rule)

$\therefore$ BD = CD (By CPCT)

Hence, AD bisects BC.

(ii) Also, by CPCT,

$\angle BAD = \angle CAD$

Hence, AD bisects $\angle A$.

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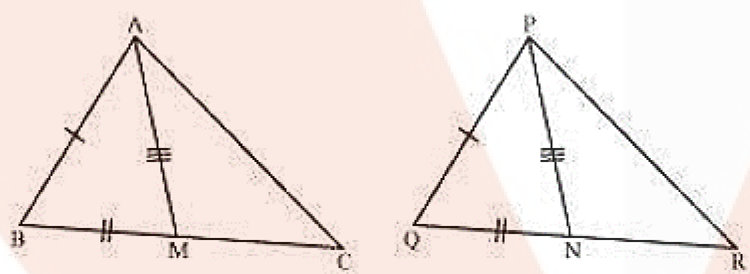
**Question 3:**

Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of $\Delta PQR$ (see the given figure). Show that:

(i) $\Delta ABM \cong \Delta PQN$

(ii) $\Delta ABC \cong \Delta PQR$




**Solution 3:**

(i) In $\Delta ABC$, AM is the median to BC.

$\therefore BM = \dfrac{1}{2} BC$

In $\Delta PQR$, PN is the median to QR.

$\therefore QN = \frac{1}{2} QR$

However, BC = QR

$\therefore \frac{1}{2} BC = \frac{1}{2} QR$

$\therefore BM = QN$ … (1)

In ΔABM and ΔPQN,

AB = PQ (Given)

BM = QN [From Equation (1)]

AM = PN (Given)

ΔABM ≅ ΔPQN (By SSS congruence rule)

∠ABM = ∠PQN (By CPCT)

∠ABC = ∠PQR … (2)

(ii) In ΔABC and ΔPQR,

AB = PQ (Given)

∠ABC = ∠PQR [From Equation (2)]

BC = QR (Given)

∴ ΔABC ≅ ΔPQR (By SAS congruence rule)

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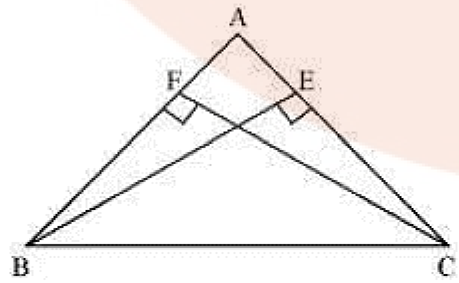
**Question 4:**

BE and CF are two equal altitudes of a triangle ABC. Using RHS congruence rule, prove that the triangle ABC is isosceles.

**Solution 4:**



In ΔBEC and ΔCFB,

∠BEC = ∠CFB (Each 90°)

BC = CB (Common)

BE = CF (Given)

∴ ΔBEC ≅ ΔCFB (By RHS congruency)

∴ ∠BCE = ∠CBF (By CPCT)

∴ AB = AC (Sides opposite to equal angles of a triangle are equal)

Hence, ΔABC is isosceles.

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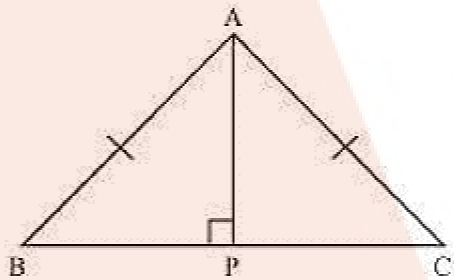
## Question 5:

ABC is an isosceles triangle with AB = AC. Draw AP ⊥ BC to show that ∠B = ∠C.

## Solution 5:




In ΔAPB and ΔAPC,

∠APB = ∠APC (Each 90°)

AB =AC (Given)

AP = AP (Common)

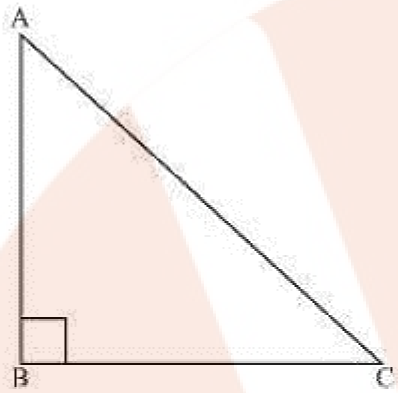
∴ ΔAPB ≅ ΔAPC (Using RHS congruence rule)

∴ ∠B = ∠C (By using CPCT)

# Exercise (7.4)

**Question 1:**
Show that in a right angled triangle, the hypotenuse is the longest side.

**Solution 1:**




Let us consider a right-angled triangle ABC, right-angled at B.

In $\Delta ABC$,
$\angle A + \angle B + \angle C = 180°$ (Angle sum property of a triangle)
$\angle A + 90° + \angle C = 180°$
$\angle A + \angle C = 90°$

Hence, the other two angles have to be acute (i.e., less than 90º).
$\angle B$ is the largest angle in $\Delta ABC$.
$\angle B > \angle A$ and $\angle B > \angle C$
AC > BC and AC > AB

[In any triangle, the side opposite to the larger (greater) angle is longer.]
Therefore, AC is the largest side in $\Delta ABC$.
However, AC is the hypotenuse of $\Delta ABC$. Therefore, hypotenuse is the longest side in a right-angled triangle.

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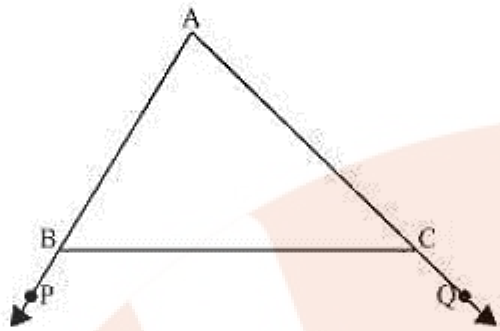
**Question 2:**
In the given figure sides AB and AC of $\Delta ABC$ are extended to points P and Q respectively. Also, $\angle PBC < \angle QCB$. Show that AC > AB.




**Solution 2:**

In the given figure,

$\angle ABC + \angle PBC = 180°$ (Linear pair)

$\angle ABC = 180° - \angle PBC$ ... (1)

Also,

$\angle ACB + \angle QCB = 180°$

$\angle ACB = 180° - \angle QCB$ … (2)

As $\angle PBC < \angle QCB$,

$180^\circ - \angle PBC > 180^\circ - \angle QCB$

$\angle ABC > \angle ACB$ [From Equations (1) and (2)]

$AC > AB$ (Side opposite to the larger angle is larger.)

Hence proved, $AC > AB$

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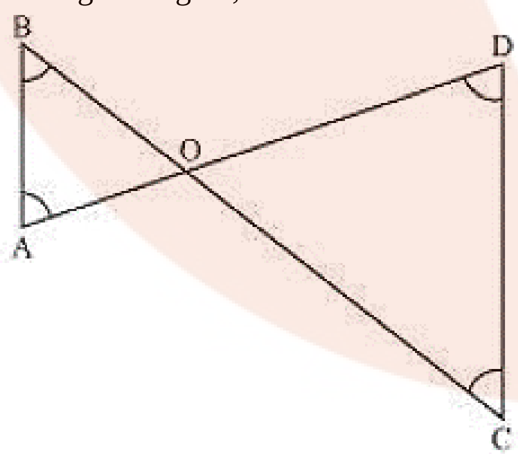
**Question 3:**

In the given figure, $\angle B < \angle A$ and $\angle C < \angle D$. Show that $AD < BC$.



**Solution 3:**

In $\Delta AOB$,

$\angle B < \angle A$

AO < BO (Side opposite to smaller angle is smaller) ... (1)

In $\Delta COD$,

$\angle C < \angle D$

OD < OC (Side opposite to smaller angle is smaller) ... (2)

On adding Equations (1) and (2), we obtain

AO + OD < BO + OC

AD < BC , proved

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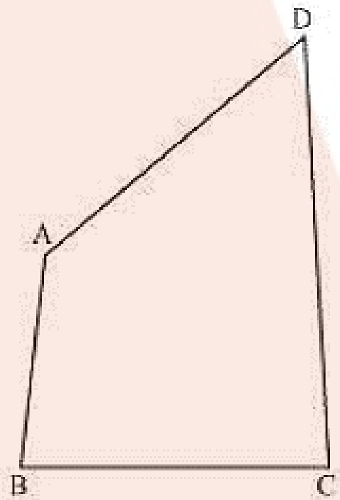
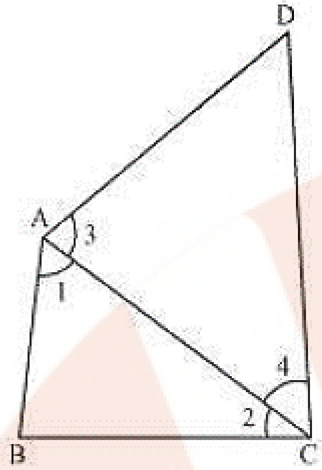
**Question 4:**

AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (see the given figure). Show that $\angle A > \angle C$ and $\angle B > \angle D$.




**Solution 4:**



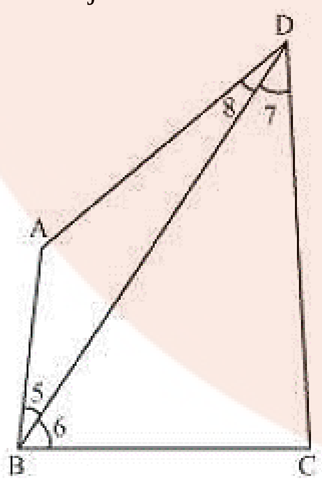

Let us join AC.

In ΔABC,
AB < BC (AB is the smallest side of quadrilateral ABCD)
∠2 < ∠1 (Angle opposite to the smaller side is smaller) ... (1)

In ΔADC,
AD < CD (CD is the largest side of quadrilateral ABCD)
∠4 < ∠3 (Angle opposite to the smaller side is smaller) ... (2)

On adding Equations (1) and (2), we obtain
∠2 + ∠4 < ∠1 + ∠3
∠C < ∠A
∠A > ∠C

Let us join BD.




In ΔABD,
AB < AD (AB is the smallest side of quadrilateral ABCD)

∠8 < ∠5 (Angle opposite to the smaller side is smaller) ... (3)

In ΔBDC,
BC < CD (CD is the largest side of quadrilateral ABCD)
∠7 < ∠6 (Angle opposite to the smaller side is smaller) ... (4)

On adding Equations (3) and (4), we obtain
∠8 + ∠7 < ∠5 + ∠6
∠D < ∠B
∠B > ∠D (Hence, proved)

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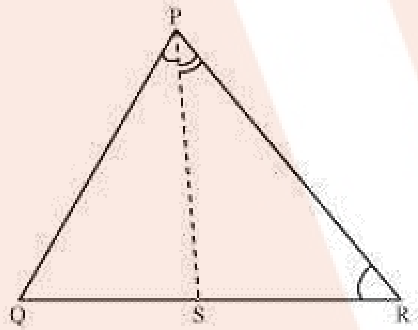
**Question 5:**
In the given figure, PR > PQ and PS bisects ∠QPR. Prove that ∠PSR > ∠PSQ.




**Solution 5:**
As PR > PQ,
∠PQR > ∠PRQ (Angle opposite to larger side is larger) ... (1)
PS is the bisector of ∠QPR.
∠QPS = ∠RPS ... (2)

∠PSR is the exterior angle of ΔPQS.
∠PSR = ∠PQR + ∠QPS ... (3)

∠PSQ is the exterior angle of ΔPRS.
∠PSQ = ∠PRQ + ∠RPS ... (4)

Adding Equations (1) and (2), we obtain
∠PQR + ∠QPS > ∠PRQ + ∠RPS

∠PSR > ∠PSQ [Using the values of Equations (3) and (4)]

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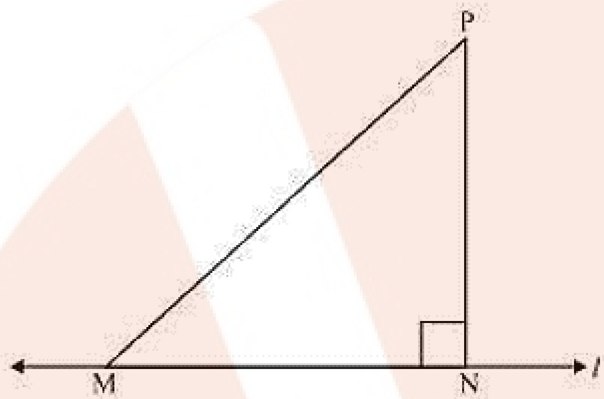
**Question 6:**
Show that of all line segments drawn from a given point not on it, the perpendicular line segment is the shortest.

**Solution 6:**




Let us take a line $l$ and from point $P$ (i.e., not on line $l$), draw two line segments PN and PM. Let PN be perpendicular to line $l$ and PM is drawn at some other angle.

In ΔPNM,
$\angle N = 90^\circ$
$\angle P + \angle N + \angle M = 180^\circ$ (Angle sum property of a triangle)
$\angle P + \angle M = 90^\circ$

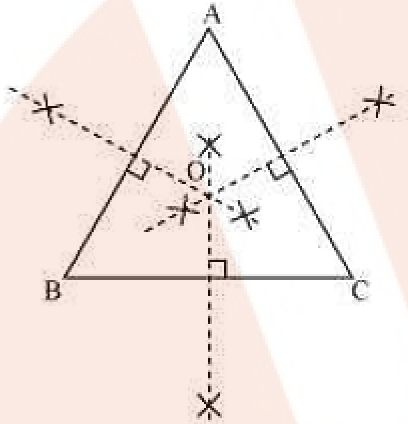
Clearly, $\angle M$ is an acute angle.
$\angle M < \angle N$
PN < PM (Side opposite to the smaller angle is smaller)

Similarly, by drawing different line segments from P to l, it can be proved that PN is smaller in comparison to them.
Therefore, it can be observed that of all line segments drawn from a given point not on it, the perpendicular line segment is the shortest.

# Exercise (7.5)

**Question 1:**
ABC is a triangle. Locate a point in the interior of $\Delta ABC$ which is equidistant from all the vertices of $\Delta ABC$.

**Solution 1:**
Circumcentre of a triangle is always equidistant from all the vertices of that triangle. Circumcentre is the point where perpendicular bisectors of all the sides of the triangle meet together.

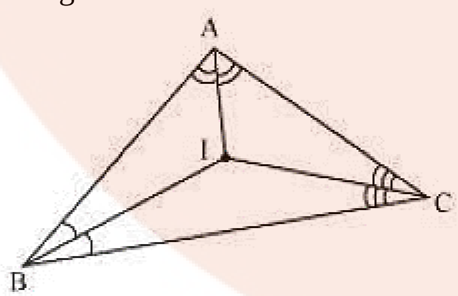



In $\Delta ABC$, we can find the circumcentre by drawing the perpendicular bisectors of sides AB, BC, and CA of this triangle. O is the point where these bisectors are meeting together. Therefore, O is the point which is equidistant from all the vertices of $\Delta ABC$.

---

**Question 2:**
In a triangle locate a point in its interior which is equidistant from all the sides of the triangle.

**Solution 2:**
The point which is equidistant from all the sides of a triangle is called the incentre of the triangle. Incentre of a triangle is the intersection point of the angle bisectors of the interior angles of that triangle.




Here, in $\Delta ABC$, we can find the incentre of this triangle by drawing the angle bisectors of the interior angles of this triangle. I is the point where these angle bisectors are intersecting each other. Therefore, I is the point equidistant from all the sides of $\Delta ABC$.

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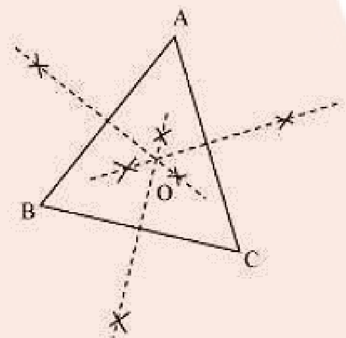
### Question 3:

In a huge park people are concentrated at three points (see the given figure)


A: where there are different slides and swings for children,
B: near which a man-made lake is situated,
C: which is near to a large parking and exit.
Where should an ice-cream parlour be set up so that maximum number of persons can approach it?
(*Hint*: The parlor should be equidistant from A, B and C)

### Solution 3:

Maximum number of persons can approach the ice-cream parlour if it is equidistant from A, B and C. Now, A, B and C form a triangle. In a triangle, the circumcentre is the only point that is equidistant from its vertices. So, the ice-cream parlour should be set up at the circumcentre O of $\Delta ABC$.




In this situation, maximum number of persons can approach it. We can find circumcentre O of this triangle by drawing perpendicular bisectors of the sides of this triangle.

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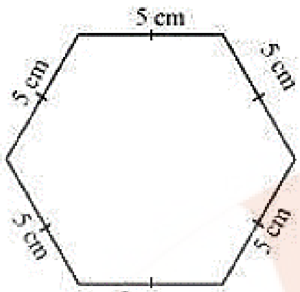
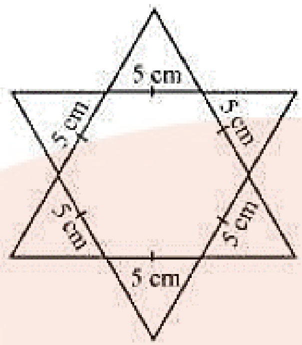
### Question 4:

Complete the hexagonal and star shaped *rangolies* (see the given figures) by filling them with as many equilateral triangles of side 1 cm as you can. Count the number of triangles in each case. Which has more triangles?



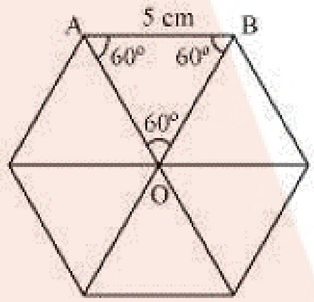

(I)




(II)

**Solution 4:**

It can be observed that hexagonal-shaped *rangoli* has 6 equilateral triangles in it.




Area of $\Delta OAB = \dfrac{\sqrt{3}}{4}(\text{side})^2 = \dfrac{\sqrt{3}}{4}(5)^2$

$= \dfrac{\sqrt{3}}{4}(25) = \dfrac{25\sqrt{3}}{4}\ \text{cm}^2$

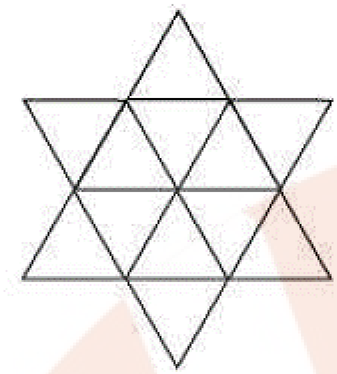
Area of hexagonal-shaped *rangoli* $= 6 \times \dfrac{25\sqrt{3}}{4} = \dfrac{75\sqrt{3}}{2}\ \text{cm}^2$

Area of equilateral triangle having its side as 1 cm $= \dfrac{\sqrt{3}}{4}(1)^2 = \dfrac{\sqrt{3}}{4}\ \text{cm}^2$

Number of equilateral triangles of 1 cm side that

can be filled in this hexagonal-shaped *Rangoli* $= \dfrac{\frac{75\sqrt{3}}{2}}{\frac{\sqrt{3}}{4}} = 150$

Star-shaped *rangoli* has 12 equilateral triangles of side 5 cm in it.



Area of star-shaped *rangoli* = $12\times\frac{\sqrt{3}}{4}\times(5)^2=75\sqrt{3}$

Number of equilateral triangles of 1 cm side that can be filled in this star-shaped *rangoli* =

$$\frac{75\sqrt{3}}{\frac{\sqrt{3}}{4}}=300$$

Therefore, star-shaped rangoli has more equilateral triangles in it.