



MATHS

BOOKS - NCERT MATHS (ENGLISH)

TRIANGLES

Multiple Choice Questions

1. Which of the following is not a criterion for congruence of triangle ?

A. SAS

B. ASA

C. SSA

D. SSS

Answer: C



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2. If $AB = QR$, $BC = PR$ and $CA = PQ$ then

A. $\triangle ABC \cong \triangle PQR$

B. $\triangle CBA \cong \triangle PQR$

C. $\triangle BAC \cong \triangle RPQ$

D. $\triangle PQR \cong \triangle BCA$

Answer: B



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3. In $\triangle ABC$, if $AB=AC$ and $\angle B = 50^\circ$, then $\angle C$ is equal to

A. 40°

B. 50°

C. 80°

D. 130°

Answer: B



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4. In $\triangle ABC$, if $BC=AB$ and $\angle B = 80^\circ$, then $\angle A$ is equal to

A. 80°

B. 40°

C. 50°

D. 100°

Answer: C



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5. In $\triangle PQR$, If $\angle R = \angle P$, $QR = 4$ cm and $PR = 5$ cm.

Then, the length of PQ is

A. 4 cm

B. 5 cm

C. 2 cm

D. 2.5 cm

Answer: A



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6. If D is a Point on the side BC of a $\triangle ABC$ such that AD bisects $\angle BAC$. Then

A. $BD=CD$

B. $BA > BD$

C. $BD > BA$

D. $CD > CA$

Answer: B



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7. It is given that $\triangle ABC \cong \triangle FDE$ and $AB= 5 \text{ cm}$,
 $\angle B = 40^\circ$ and $\angle A = 80^\circ$ then which of the
following is true ?

A. $DF = 5\text{cm}$, $\angle F = 60^\circ$

B. $DF = 5\text{cm}$, $\angle E = 60^\circ$

C. $DE = 5\text{cm}$, $\angle E = 60^\circ$

D. $DE = 5\text{cm}$, $\angle D = 60^\circ$

Answer: B



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8. If two sides of a triangle are of length 5 cm and 1.5 cm, then the length of third side of the triangle cannot be

A. 3.6 cm

B. 4.1 cm

C. 3.8 cm

D. 3.4 cm

Answer: D



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9. In $\triangle PQR$, if $\angle R > \angle Q$, then

A. $QR > PR$

B. $PQ > PR$

C. $PQ < PR$

D. $QR > PR$

Answer: B



10. In $\triangle ABC$ and $\triangle PQR$, If $AB=AC$,
 $\angle C = \angle P$ and $\angle B = \angle Q$, then the two triangles
are

- A. isosceles but not congruent
- B. isosceles and congruent
- C. congruent but not isosceles
- D. Neither congruent nor isosceles

Answer: A



11. In $\triangle ABCDEF$, $AB=FD$ and $\angle A = \angle D$. The two triangle will be congruent by SAS axiom,if

A. $BC=EF$

B. $AC=DE$

C. $AC=EF$

D. $BC=DE$

Answer: B



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Very Short Answer Type Questions

1. In $\triangle ABC$ and $\triangle PQR$, $\angle A = \angle Q$ and $\angle B = \angle R$.

Which side of $\triangle PQR$ should be equal to side AB of $\triangle ABC$, so that the two triangle are congruent ? Give reason for your answer.



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2. In $\triangle ABC$ and $\triangle PQR$, $\angle A = \angle Q$ and $\angle B = \angle R$.

Which side of $\triangle PQR$ should be equal to side BC of $\triangle ABC$, so that the two triangle are congruent ? Give reason for your answer.



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3. If two sides and an angle of one triangle are equal to two sides and an angle of another triangle , then the two triangles must be congruent'. Is the statement true? Why?



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4. If two sides and an angle of one triangle are equal to two sides and an angle of another triangle , then the two triangles must be congruent'. Is the statement true? Why?



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5. Is it possible to construct a triangle with lengths of its sides as 4 cm, 3 cm and 7 cm? Give reason for your answer.



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6. It is given that $\triangle ABC \cong \triangle RPQ$. Is it true to say that $BC = QR$? Why?



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7. It $\triangle PQR \cong \triangle EDF$, then is it true to say the $PR = EF$?
Given reason for your answer.





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8. In ΔPQR , $\angle P = 70^\circ$ and $\angle R = 30^\circ$. Which side of this triangle is the longest? Give reason for your answer



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9. AD is a median of the ΔABC . Is it true $AB + BC + CA > 2AD$? Give reason for your answer



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10. M is point on side BC of a triangle $\triangle ABC$ such that AM is the bisector of $\angle BAC$. Is it true to say that perimeter of the triangle is greater than $2 AM$? Give reason for your answer ?



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11. Is it possible to construct a triangle with lengths of its sides as 9 cm, 7 cm and 17 cm? Give reason for your answer.



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12. Is it possible to construct a triangle with length of its sides as 8 cm ,7 cm and 4 cm ? Give reason for your answer



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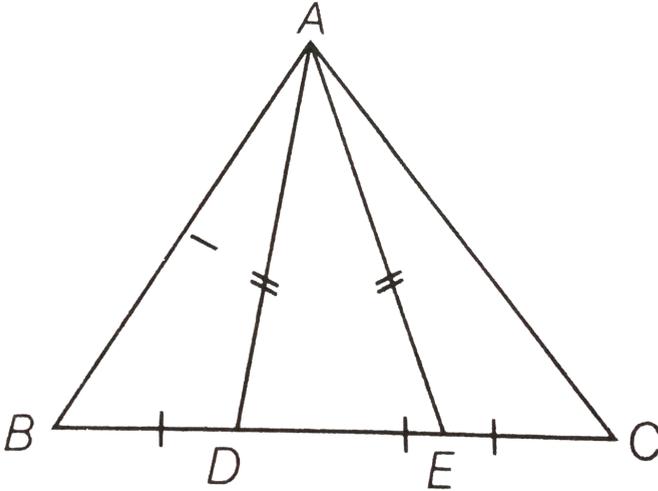
Short Answer Type Questions

1. ABC is an isosceles triangle with $AB = AC$ and BD,CE are its two medians. Show that $BD = CE$.



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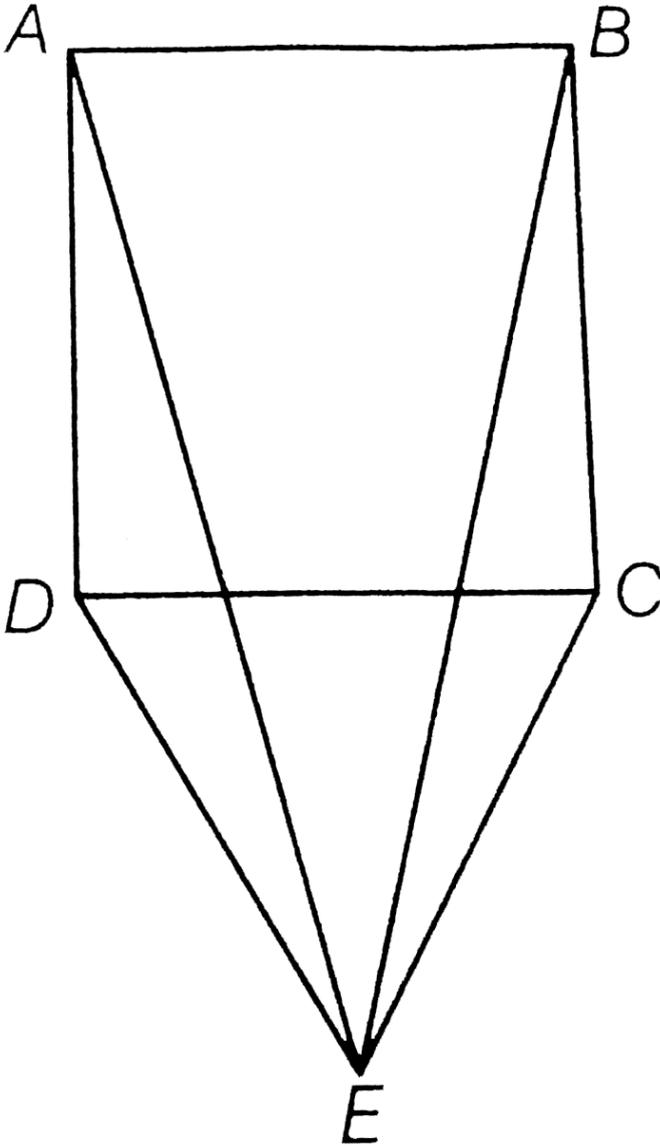
2. In figure, D and E are Points on side BC of a ΔABC such that $BD=CE$ and $AD=AE$. Show that $\Delta ABD \cong \Delta ACE$.



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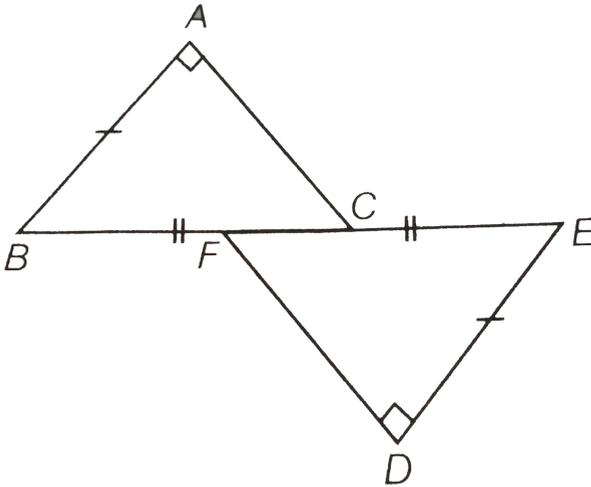
3. In the given figure, ΔCDE is an equilateral triangle formed on a side CD of a square $ABCD$. Show

that $\triangle ADE \cong \triangle BCE$.



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4. In figure , $BA \perp AC$, $DE \perp DF$ such that $BA = DE$ and $BF = EC$. Show that $\triangle ABC \cong \triangle DEF$.



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5. If Q is a point on the side SR of a triangle $\triangle PSR$ such that $PQ=PR$ then prove that $PS > PQ$

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6. S is any point on side QR of a $\triangle PQR$. Show that $PQ + QR + RP > 2PS$.



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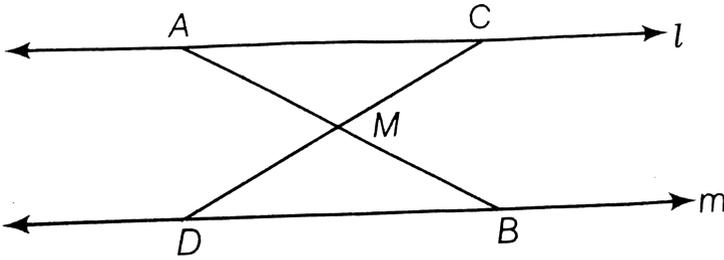
7. D is any point on side AC of a $\triangle ABC$ with $AB = AC$. Show that $CD < BD$.



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8. In the given figure $l \parallel m$ and M is the mid-point of a line segment AB . Show that M is also the mid-point of

any line segment CD , having its end points on l and m , respectively.



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9. The bisectors of $\angle B$ and $\angle C$ of an isosceles triangle with $AB = AC$ intersect each other at a point O . BO is produced to meet AC at a point M . Prove that $\angle MOC = \angle ABC$.

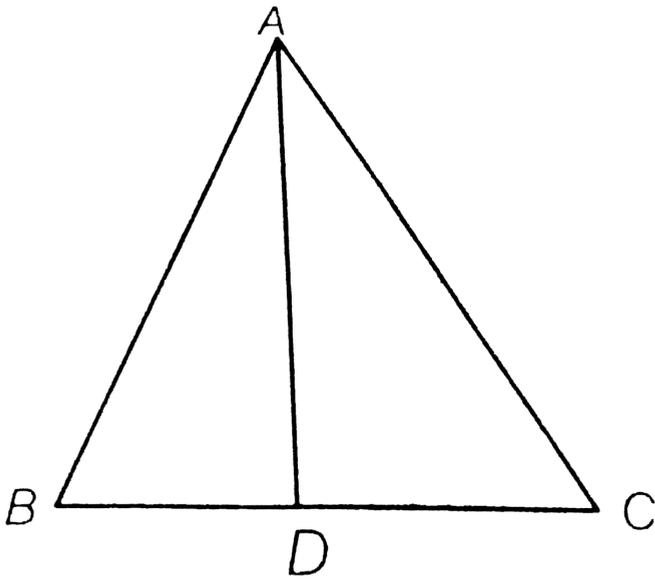
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10. Bisectors of the angles B and C of an isosceles $\triangle ABC$ with $AB = AC$ intersect each other at O . Show that external angle adjacent to $\angle ABC$ is equal to $\angle BOC$.



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11. In following figure if AD is the bisector of $\angle ABC$, then prove that $AB > BD$



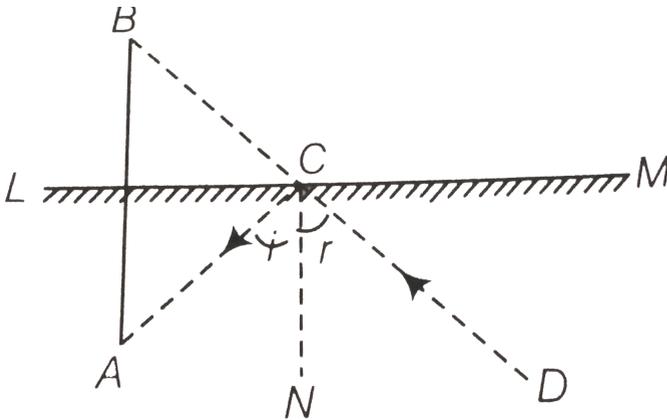
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Long Answer Type Questions

1. Find all the angles of an equilateral triangle.

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2. The image of the an object placed at a point A before a plane mirror LM is seen at the point B by an observer at D as shown in figure.prove that the image is as far behind the mirror as the object is in front of the mirror.

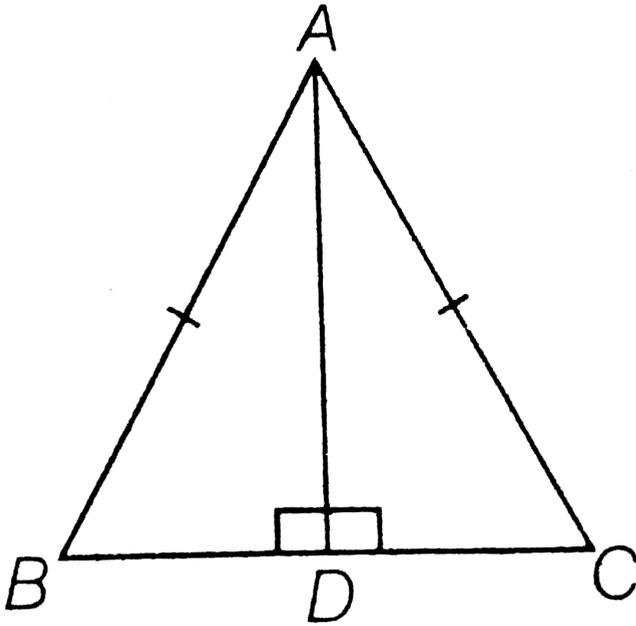


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3. ABC is an isosceles triangle with $AB=AC$ and D is a point on BC such that $AD \perp BC$ (see figure). To

prove that $\angle BAD = \angle CAD$ a student proceeded as

follows



In $\triangle ABD$ and $\triangle ACD$, we have

$$AB = AC \quad [\text{ Given}]$$

$$\angle B = \angle C \quad [\because AB=AC]$$

$$\text{and} \quad \angle ADB = \angle ADC$$

Therefore

$$\triangle ABD \cong \triangle ACD \quad [\text{by AAS congruence rule}]$$

So , $\angle BAD = \angle CAD$ [byCPCT]

What is the defect in the above argument ?

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4. P is a point on the bisector of $\angle ABC$.If the line through P , parallel to BA meet at Q ,prove that $\triangle BPQ$ is an isosceles triangle.

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5. $ABCD$ is a quadrilateral in which $AB = BC$ and $AD = CD$,show that BD bisects both the $\angle ABC$ and $\angle ADC$.



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6. ABC is a right triangle with $AB = AC$. If bisector of $\angle A$ meet BC at D then prove that $BC = 2 AD$.



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7. O is a point in the interior of a square $ABCD$ such that $\triangle OAB$ is an equilateral triangle. Show that $\triangle OCD$ is an isosceles triangle.



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8. ABC and DBC are two triangles on the same base BC such that A and D lie on the opposite sides of BC , $AB=AC$ and $DB =DC$,Show that AD is the perpendicular bisector of BC .



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9. In Figure, AD and BE are respectively altitudes of an isosceles triangle ABC with $AC = BC$. Prove that $AE = BD$



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10. Prove that sum of any two sides of a triangle is greater than twice the median with respect to the third side.



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11. Show that in a quadrilateral ABCD

$$AB + BC + CD + DA < 2(BD + AC)$$


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12. Show that in a quadrilateral ABCD

$$AB + BC + CD + DA > AC + BD$$




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13. In a $\triangle ABC$, D is the mid point of side AC such that $BD = \frac{1}{2} AC$. Show that $\angle ABC$ is a right angle.



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14. In a right triangle, Prove that the line-segment joining the mid-point of the hypotenuse to the opposite vertex is half the hypotenuse



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15. Two lines l and m intersect at the O and P is Point on a line n Passing through the point O such that P is equidistant from l and m . Prove that n is the bisector of the angle formed by l and m



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16. The line segments joining the midpoints M and N of parallel sides AB and DC respectively of a trapezium $ABCD$ is perpendicular to both the sides AB and DC . Prove that $AD=BC$.



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17. In Figure, diagonal AC of a quadrilateral $ABCD$ bisects the angles A and C . Prove that $AB = AD$ and $CB = CD$.



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18. $\triangle ABC$ is a right triangle right angled at A such that $AB = AC$ and bisector of $\angle C$ intersects the side AB at D . Prove that $AC + AD = BC$.



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19. In Figure, AB and CD are respectively the smallest and longest sides of a quadrilateral $ABCD$. Show that

$\angle A > \angle C$ and $\angle B > \angle D$



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20. Prove that in a triangle, other than an equilateral triangle, angle opposite the longest side is greater than $\frac{2}{3}$ of a right angle.



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21. If $ABCD$ is a quadrilateral such that $AB = AD$ and $CB = CD$, then prove that AC is the perpendicular bisector of BD .



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