ODM EDUCATIONAL GROUP
Changing your Tomorrow

PERIOD 4

MATHEMATICS

CHAPTER NUMBER :~ 7
CHAPTER NAME :~ TRIANGLES

Website: www.odmegroup.org
Email: info@odmps.org
Toll Free: 1800 120 2316
Sishu Vihar, Infocity Road, Patia, Bhubaneswar- 751024

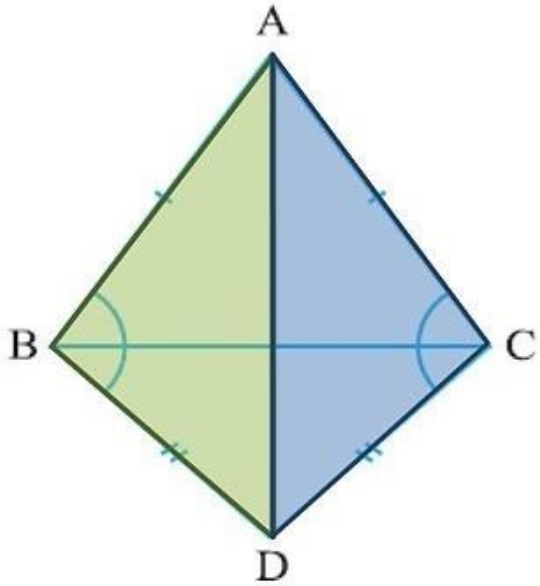
PREVIOUS KNOWLEDGE TEST

- 1. In ΔPQR the sides QP and RP have been produced to S and T such that PQ=PS and PR=PT. Prove that the segment $QR \parallel ST$.

LEARNING OUTCOME:-

1.Students will be able to solve the sums based on ASA and AAS congruence rule.

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



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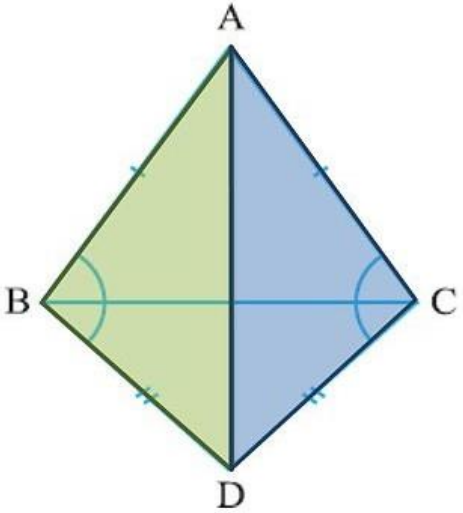


Given:

ΔABC is isosceles

So, AB = AC ...(1)

ΔDBC is isosceles

So, DB = DC ...(2)

To prove: ∠ ABD = ∠ ACD

Proof

Let us join AD.

We take ΔABD and ΔACD,

In ΔABD and ΔACD,

$AB = AC$ *(From (1))*

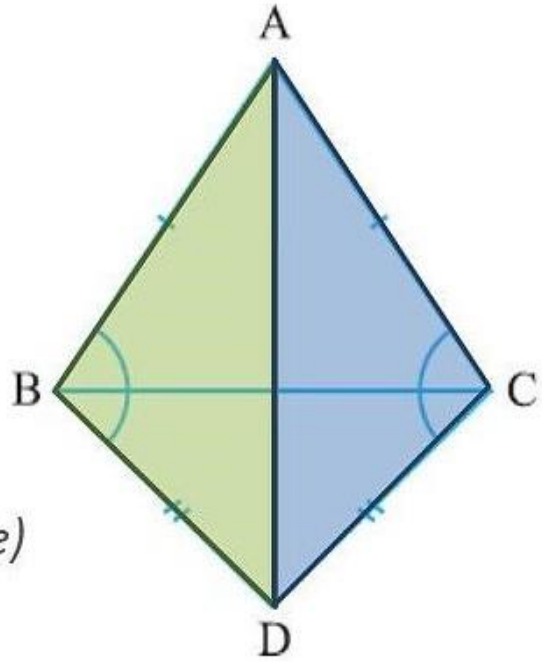
$BD = CD$ *(From (2))*

$AD = AD$ *(Common)*

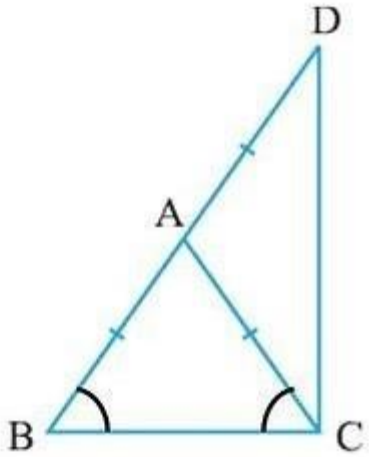
$\therefore \Delta ABD \cong \Delta ACD$ *(SSS congruence rule)*

$\Rightarrow \angle ABD = \angle ACD$ *(CPCT)*

Hence proved



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.



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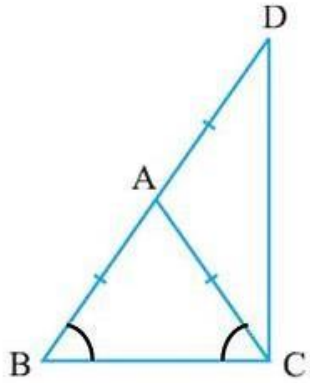


Given:

AB = AC

Also, AD = AB

i.e. AC = AB = AD

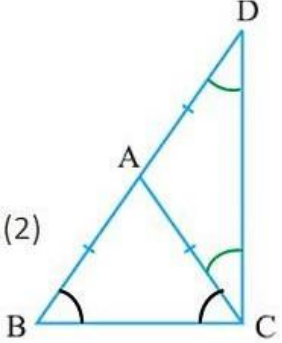
To prove: ∠BCD = 90°

Proof:

In ΔABC,

AB = AC

⇒ ∠ACB = ∠ABC *(Angles opposite to equal sides are equal)* ...(1)



In ΔACD,

AC = AD

∠ADC = ∠ACD (Angles opposite to equal sides are equal) ...(2)

In ΔBCD,

∠ABC + ∠BCD + ∠BDC = 180° *(Angle sum property of triangle)*

∠ACB + ∠ BCD + ∠ACD = 180° *(From (1) & (2))*

(∠ACB +∠ACD) + ∠ BCD = 180°

(∠ BCD) + ∠ BCD = 180°

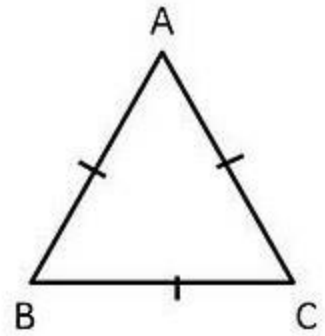
2∠ BCD = 180°

$\angle$ BCD = $\frac{180°}{2}$

∠ BCD = 90°

Hence proved

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



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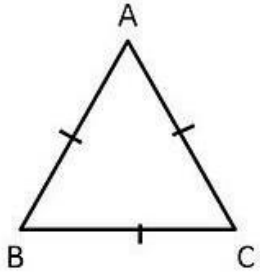


Given:

ΔABC be an equilateral triangle.

$\therefore AB = BC = AC$ *(All sides of equilateral triangle are equal)*

To prove: $\angle A = \angle B = \angle C = 60°$

Proof:

$AB = AC$

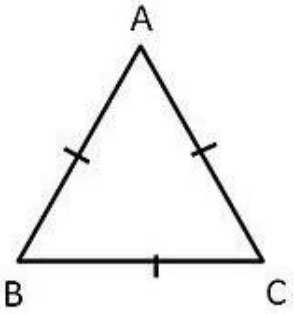
$\Rightarrow \angle C = \angle B$ *(Angles opposite to equal sides are equal)* ...(1)

Also, $AC = BC$

$\Rightarrow \angle B = \angle A$ *(Angles opposite to equal sides are equal)* ...(2)

From (1) & (2)

$\angle A = \angle B = \angle C$ ...(3)



In ΔABC,

$\angle A + \angle B + \angle C = 180°$ *(Angle sum property of triangle)*

$\Rightarrow \angle A + \angle A + \angle A = 180°$ *(From (3))*

$\Rightarrow 3\angle A = 180°$

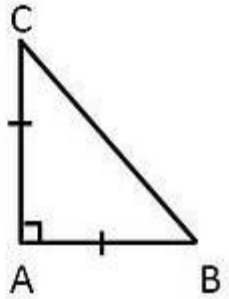
$\Rightarrow \angle A = \frac{180°}{3}$

$\Rightarrow \angle A = 60°$

$\therefore \angle A = \angle B = \angle C = 60°$

Hence proved

ABC is a right angled triangle in which $\angle A = 90°$ and AB = AC. Find $\angle B$ and $\angle C$.



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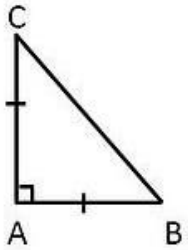


Given

$AB = AC$

$\Rightarrow \angle C = \angle B$ *(Angles opposite to equal sides are equal)* ...(1)

In ΔABC,

$\angle A + \angle B + \angle C = 180°$ *(Angle sum property of triangles)*

$\Rightarrow 90° + \angle B + \angle C = 180°$ *(Given that $\angle A = 90°$)*

$\Rightarrow 90° + \angle B + \angle B = 180°$ *(From (1))*

$\Rightarrow 2\angle B = 90°$

$\Rightarrow \angle B = 45°$

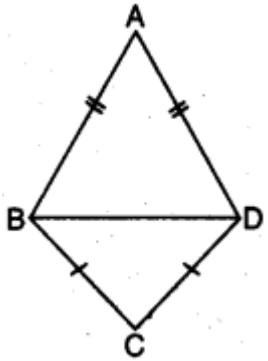
$\therefore \angle B = \angle C = 45°$

HOMEWORK ASSIGNMENT

Exercise 7.2
Question number 5,6,7,8.

AHA

In the given figure, ΔABD and ABCD are isosceles triangles on the same base BD. Prove that ∠ABC = ∠ADC.



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