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MATHS

TRIANGLES

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BASIC CONCEPTS

1. Similar Figures
2. Dissimilar Figures
3. Proportionality

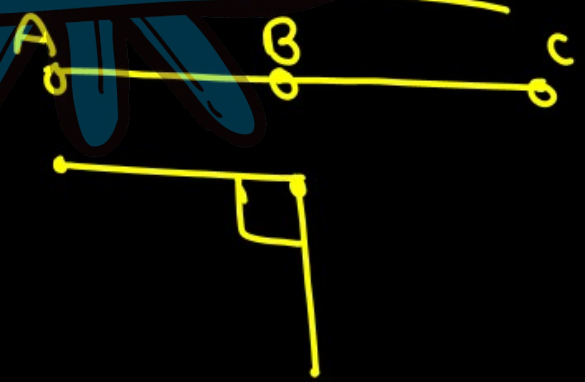
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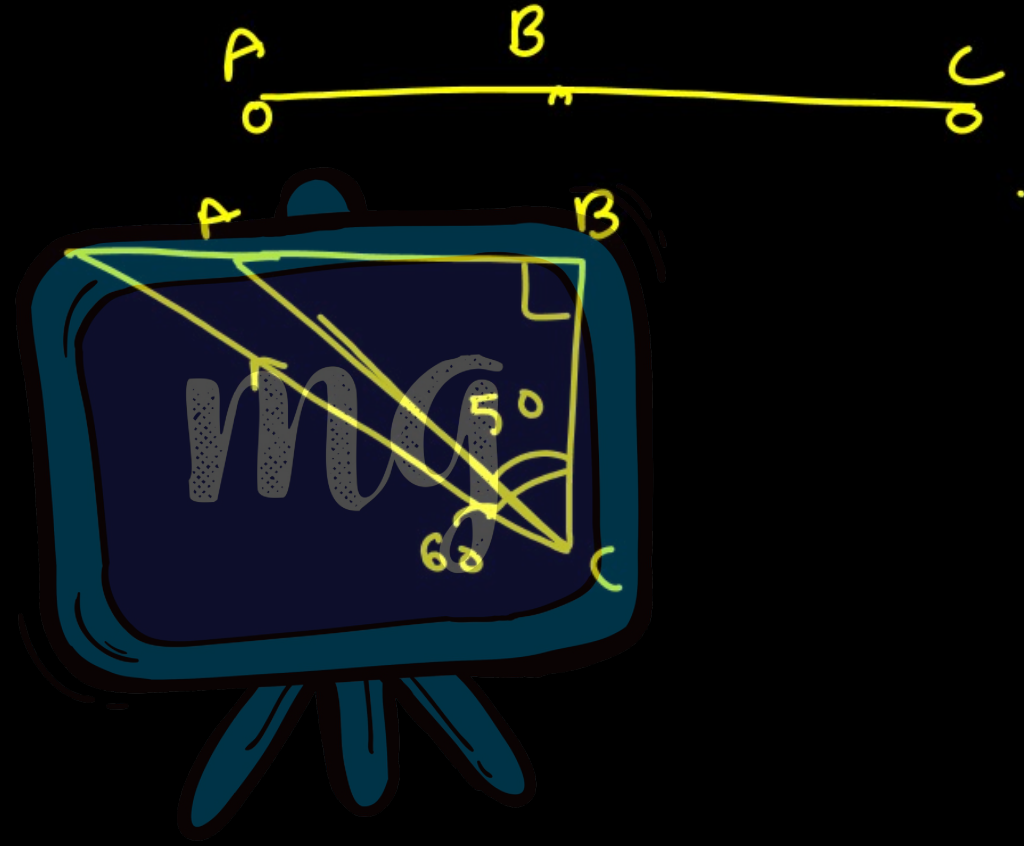
1. SIMILAR FIGURES

Geometric figures, having the same shape are known as similar figures.



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NOTE :

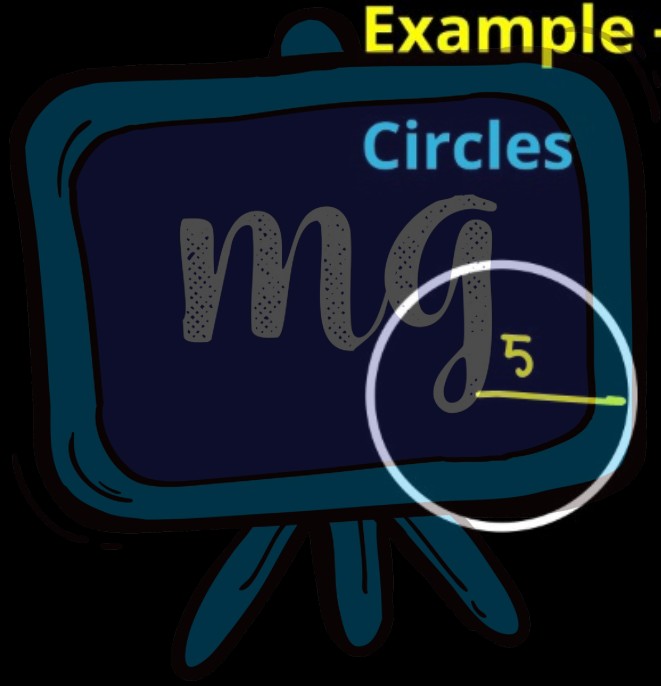
Two congruent figures are always similar but two similar figures may or may not be congruent.

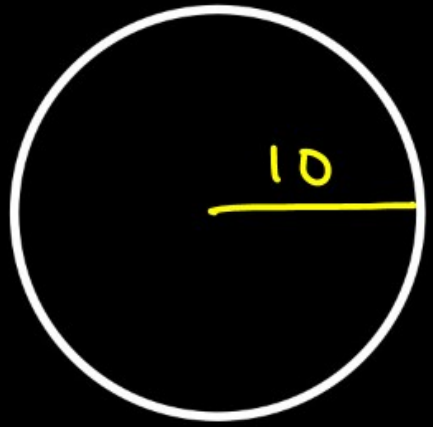
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Example –



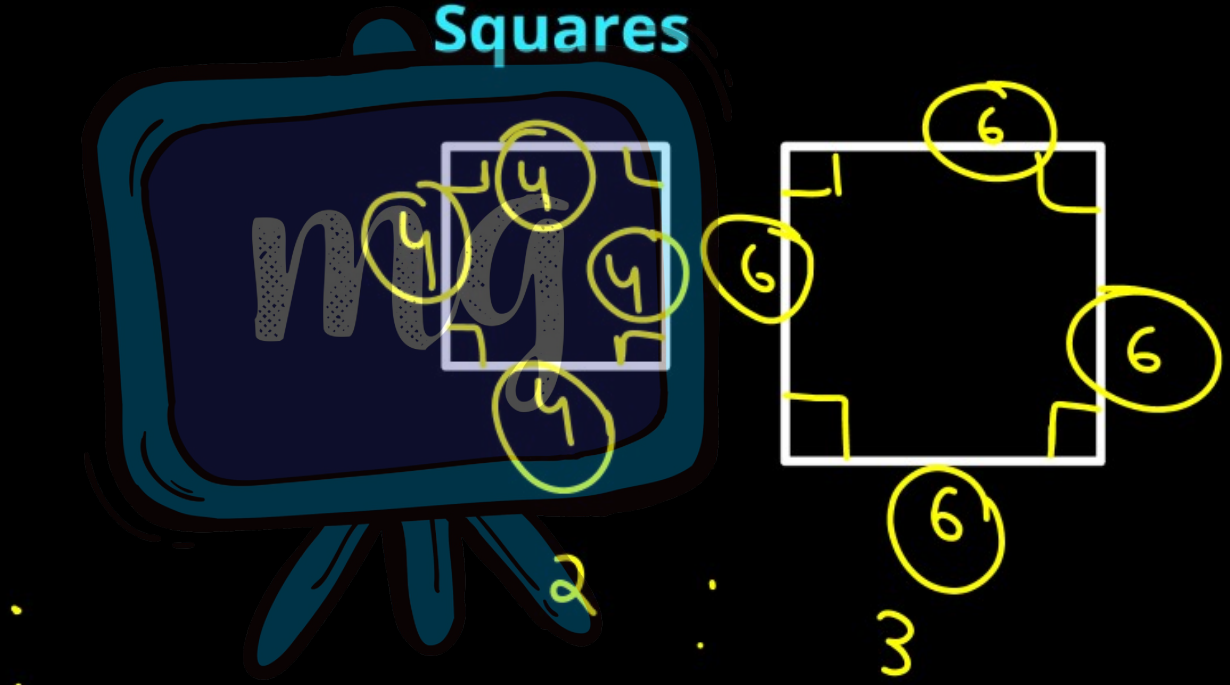


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Squares



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2. DISSIMILAR FIGURES



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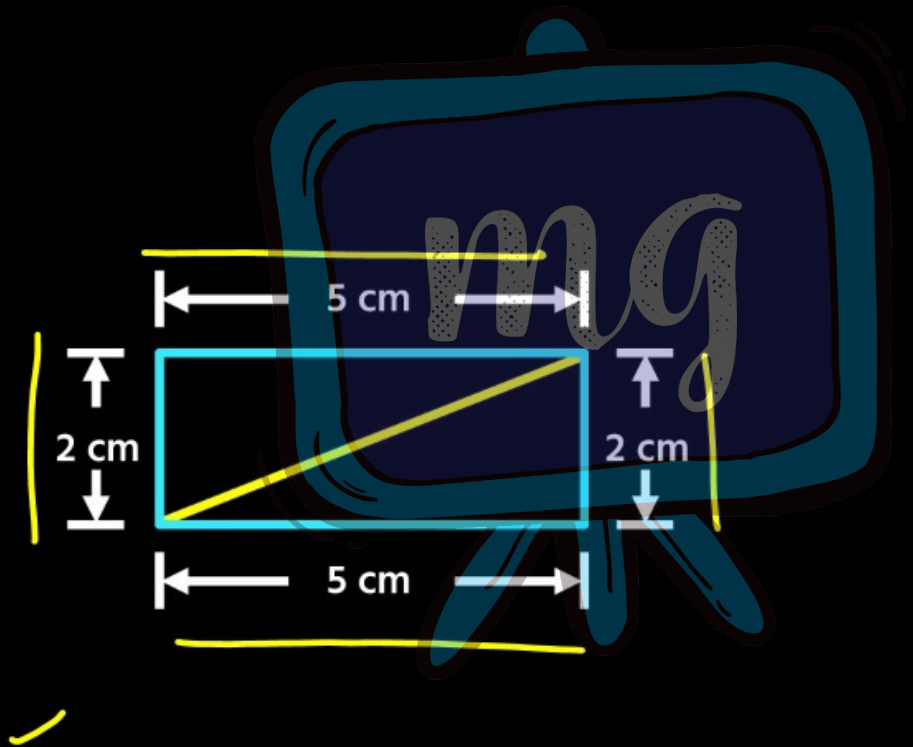
3. PROPORTIONALITY

It describes any relationship that is always in the same ratio.

$$\frac{a}{b} = \frac{c}{d}$$

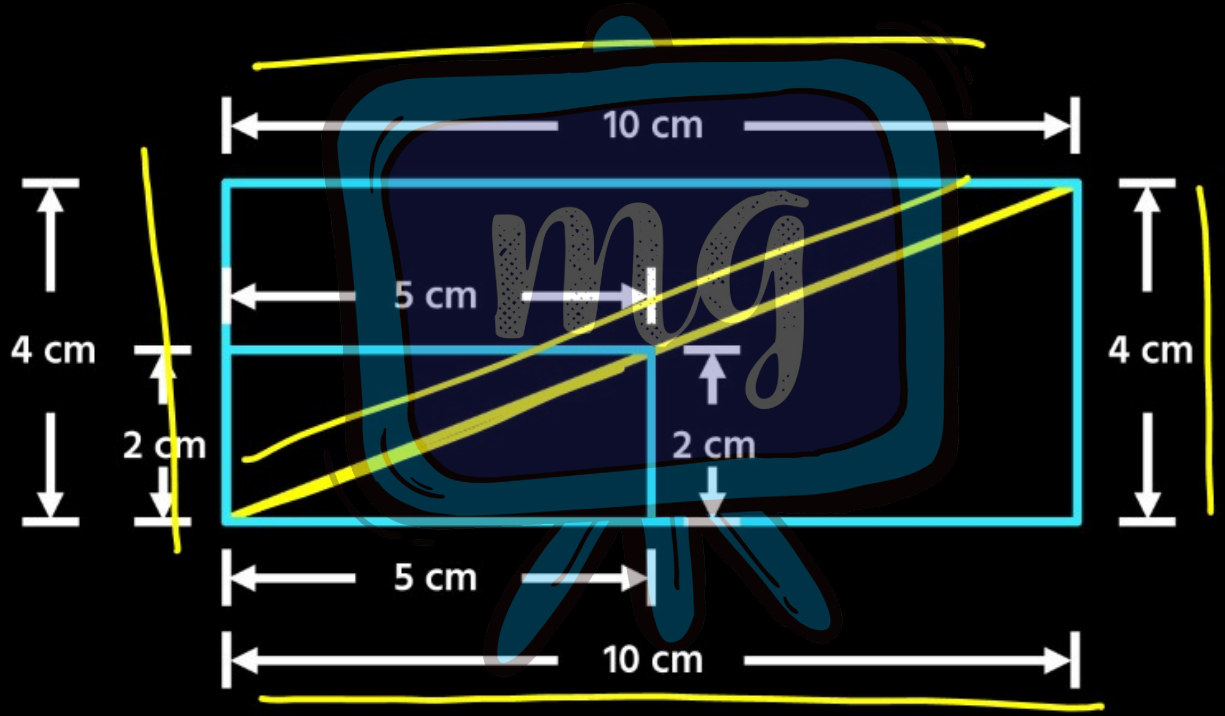
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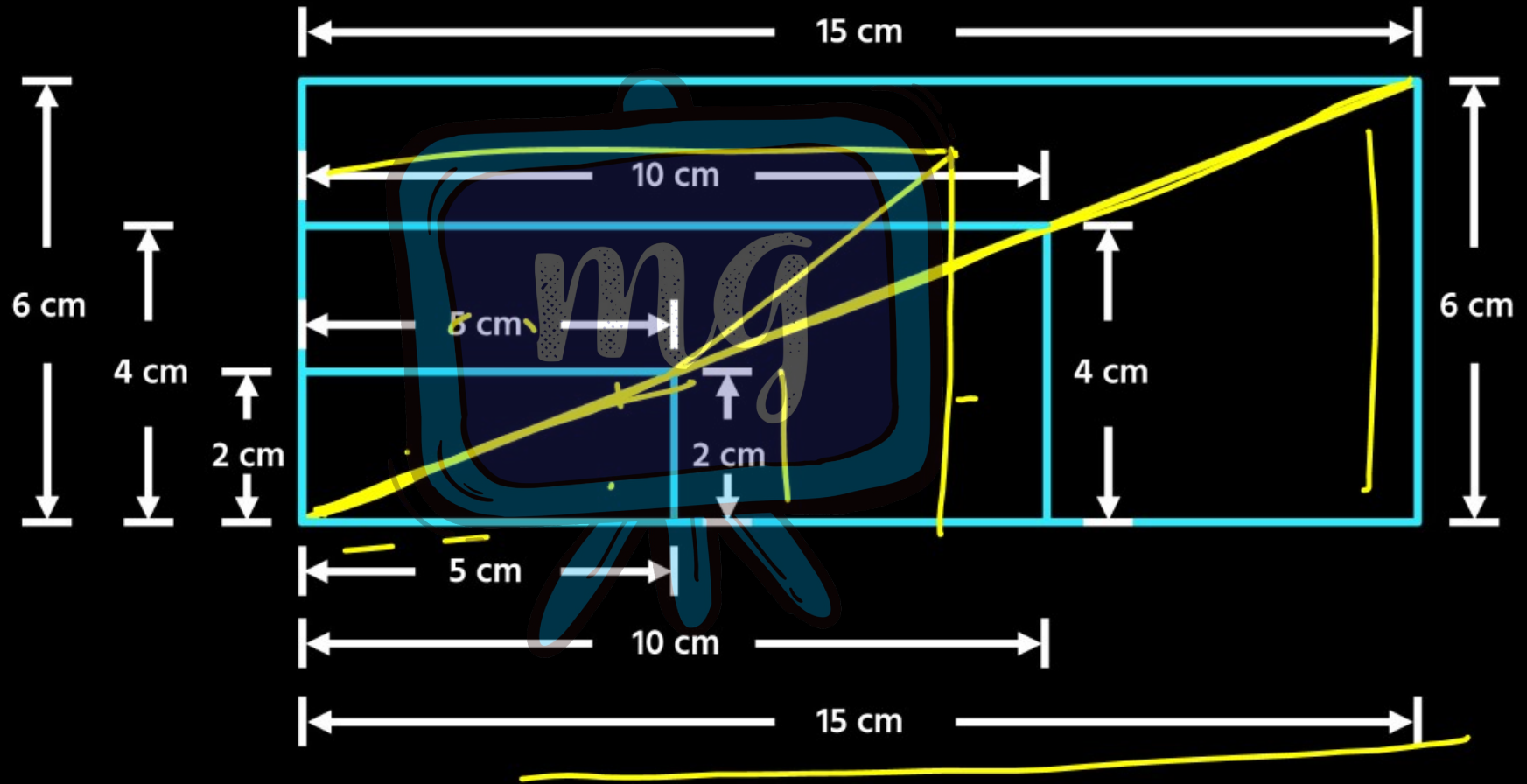
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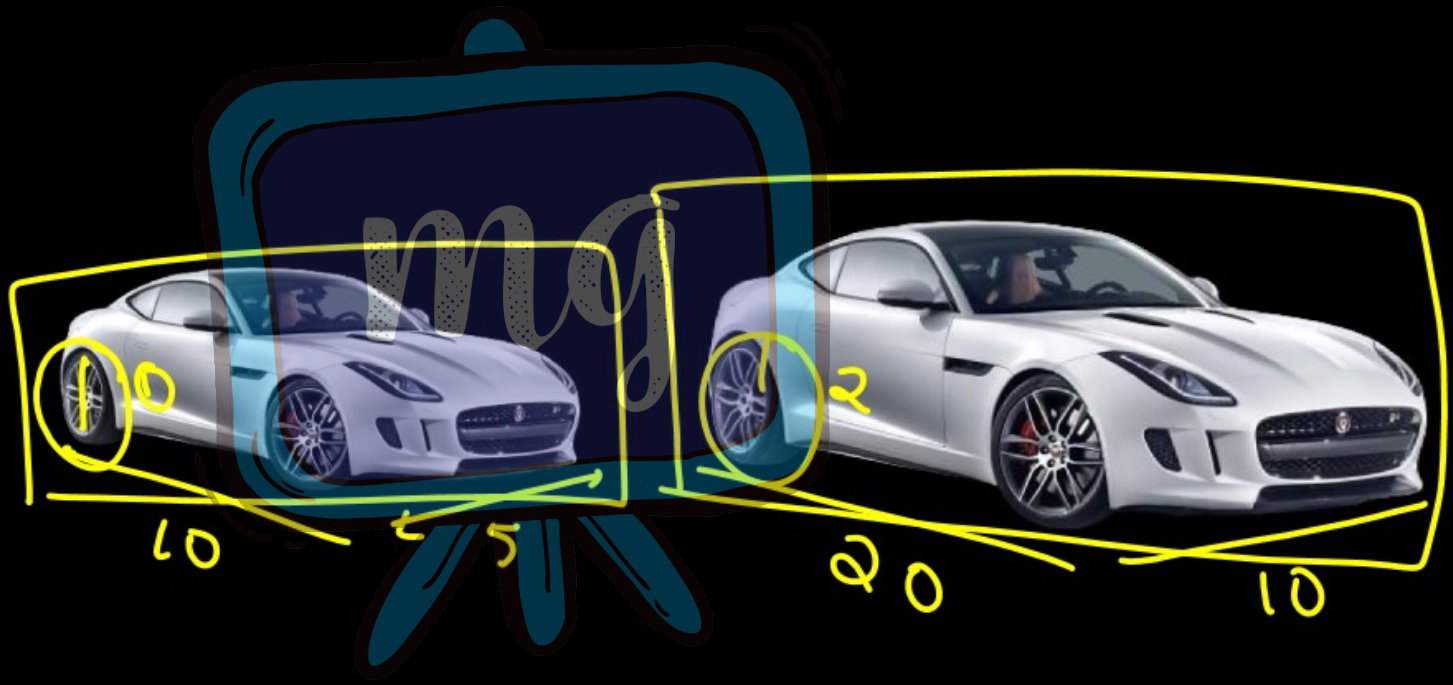
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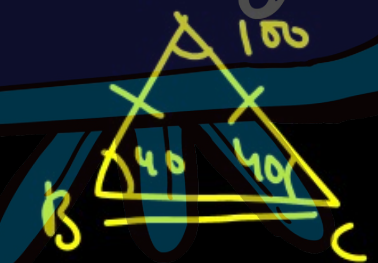
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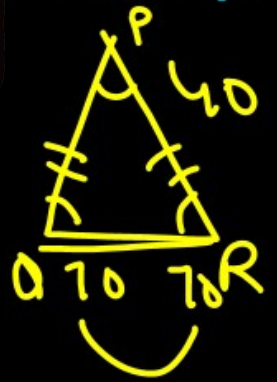
Exercise : 6.1

1. Fill in the blanks using the correct word given in brackets :

(iii) All ___ triangles are similar.

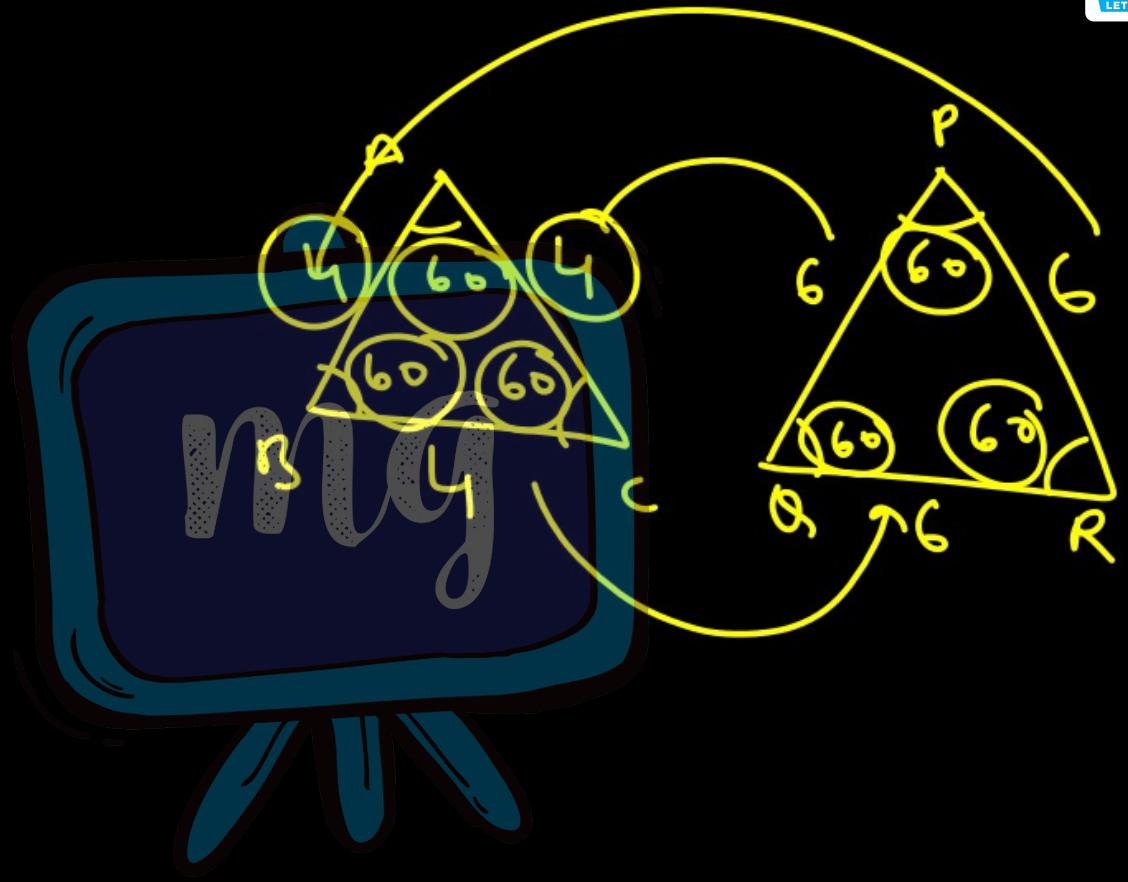
(isosceles, equilateral)





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Exercise : 6.1

(iv) Two polygons of the same number of sides are similar, if (a) their corresponding angles are ____ and (b) their corresponding sides are ____ . (equal,proportional)

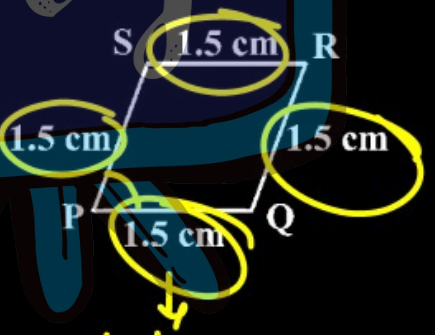
(a) (b)

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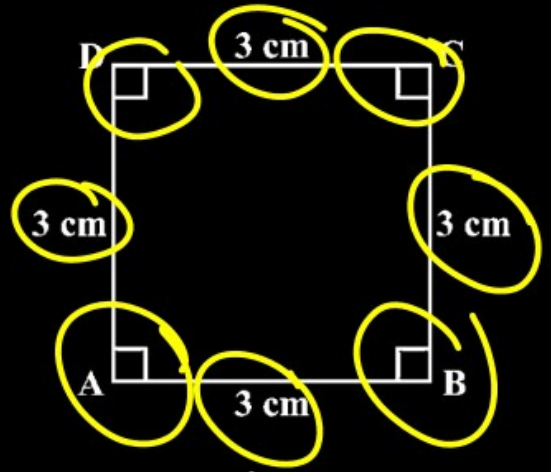
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Exercise : 6.1

3. State whether the following quadrilaterals are similar or not :



Rhombus



Square

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THEOREM 6.1

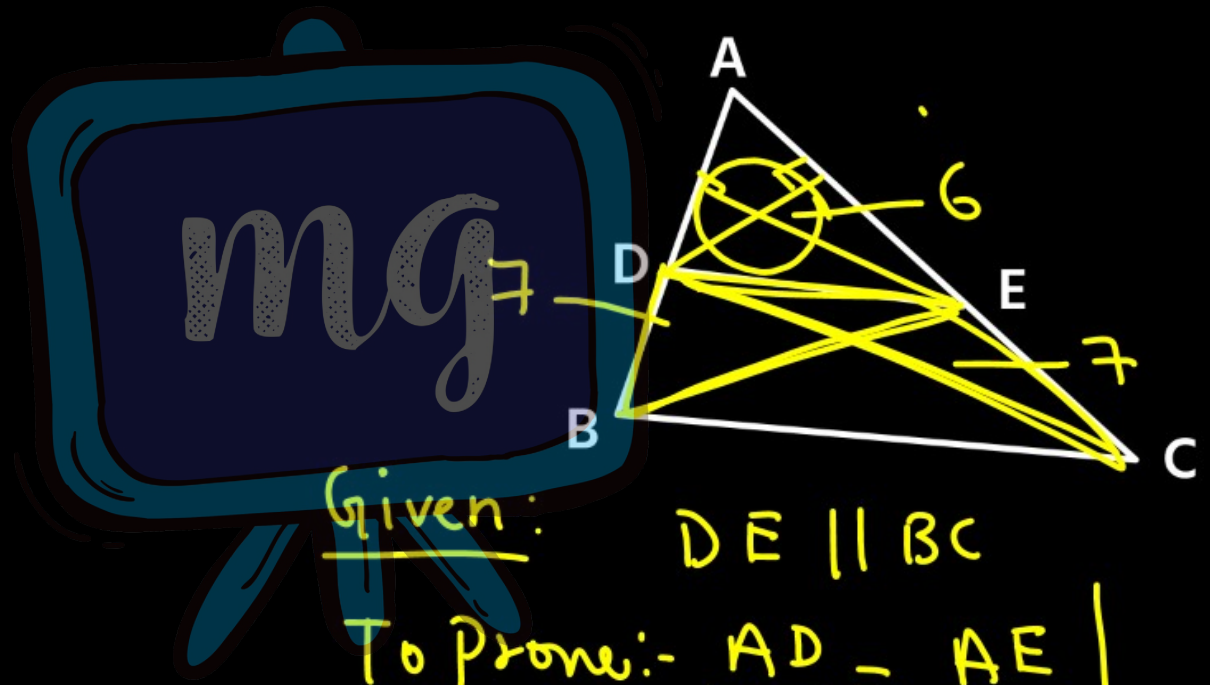
If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

[CBSE 2002 C, 05, 06 C, 07, 08, 09, 10, 19, 2023]

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Given: $DE \parallel BC$

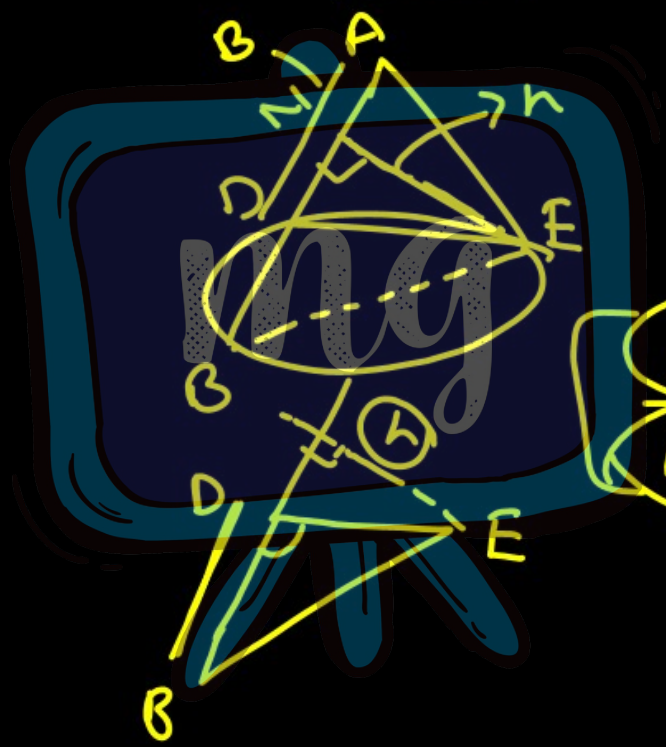
To Prove:- $\frac{AD}{DB} = \frac{AE}{EC}$

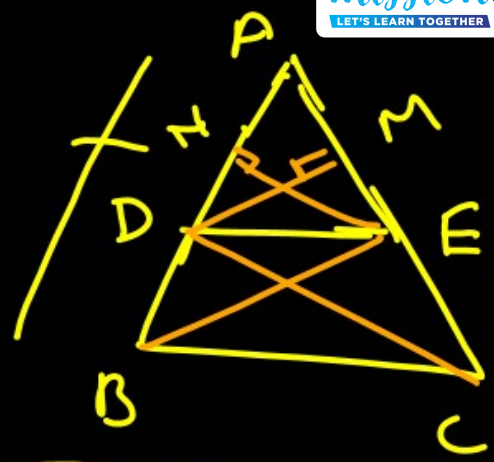
Const:- $DM \perp AC$ | Join D to C
$EN \perp AB$ | Join B to E

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Proof :-





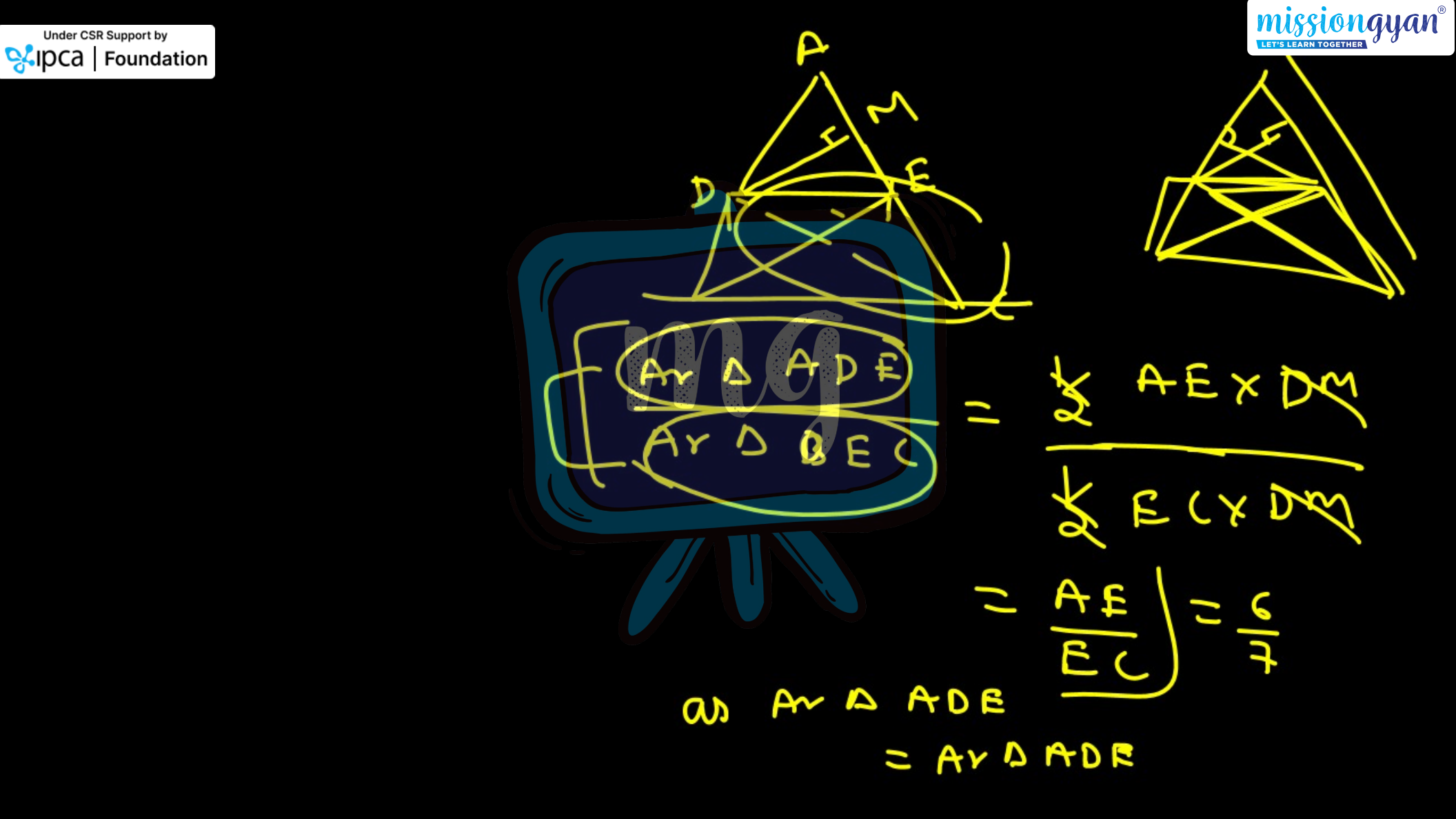
Ar Δ ADE = ½ AD × EN

Ar Δ BDE = ½ BD × EN

= AD / BD

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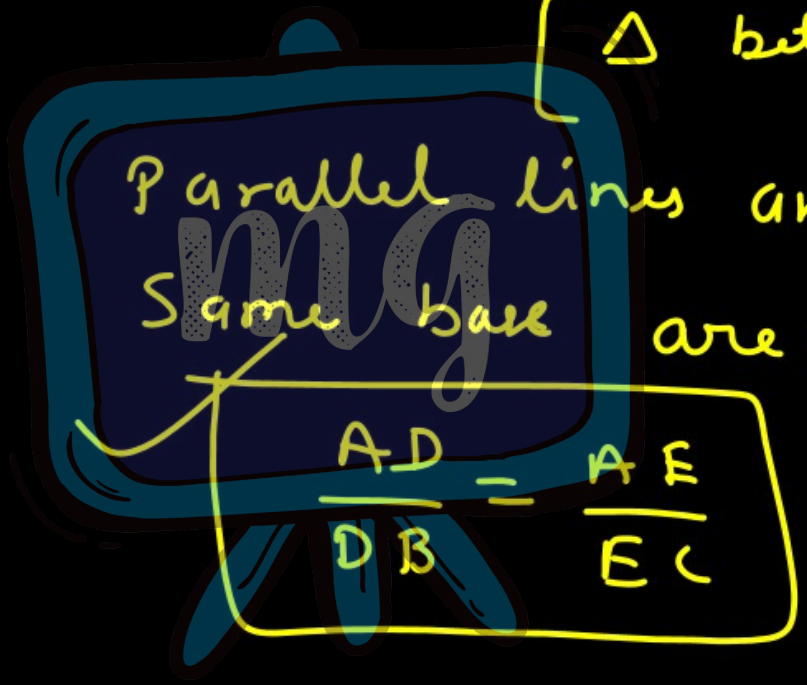


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Ar △ B D E = Ar △ D E C

[△ between the same Parallel lines and on the same base are equal in Area]



H P.

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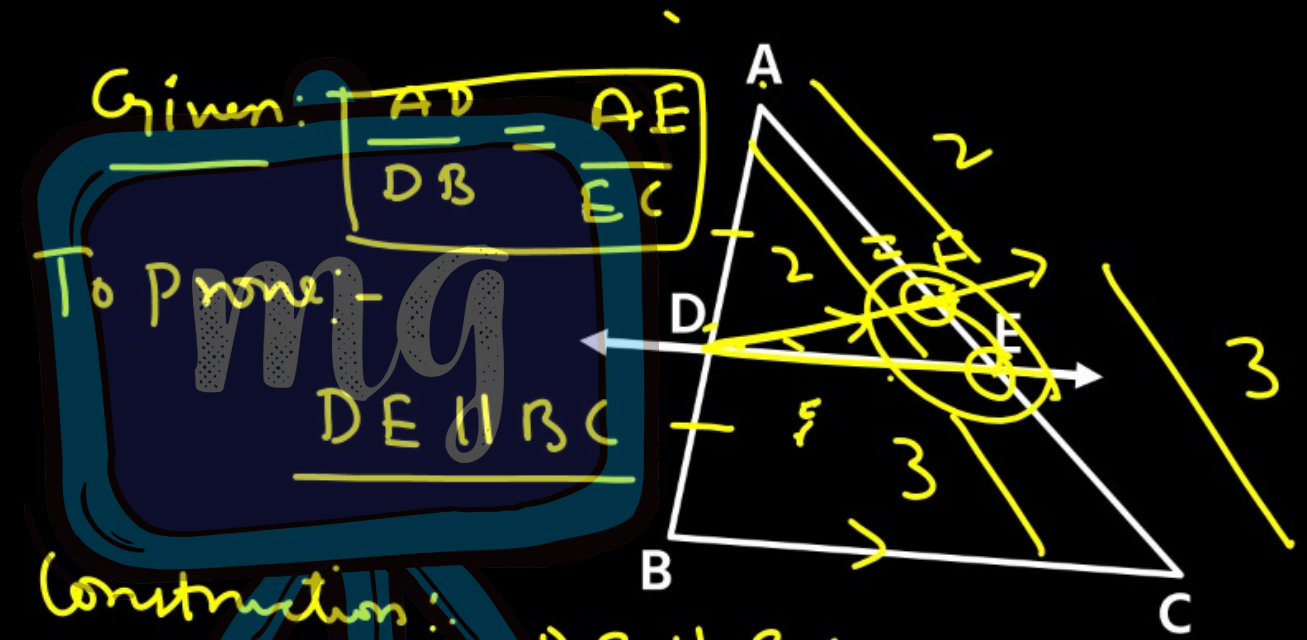
THEOREM 6.2

If a line divides any two sides of a triangle in the same ratio, than the line is parallel to the third side.

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Given: $\frac{AD}{DB} = \frac{AE}{EC}$

To Prove:- $DE \parallel BC$

Construction: $DF \parallel BC$

From BPT $\frac{AD}{DB} = \frac{AF}{FC}$ ... (1)

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Given that $\frac{AD}{DB} = \frac{AE}{EC}$

Hence $\frac{AF}{FC} = \frac{AE}{EC}$

$\frac{AF}{FC} = \frac{2}{3} = \frac{AE}{EC}$

E and F coincides

DE ∥ BC H.P.