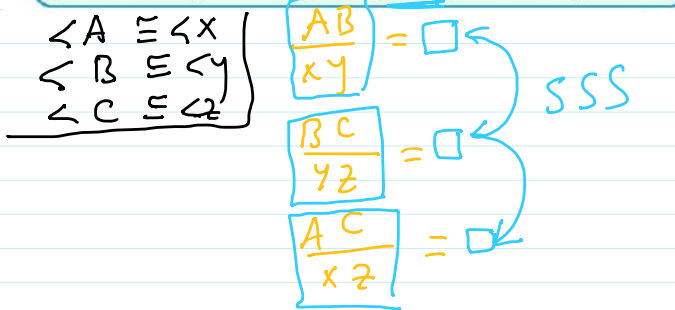


Exercise for Similarity of Triangles

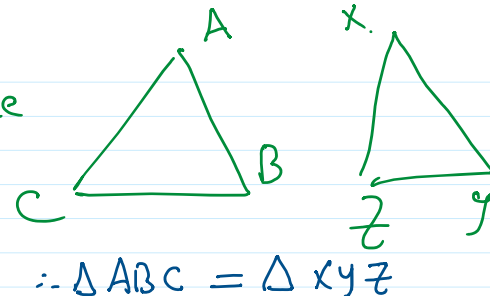
Tuesday, September 9, 2025 3:18 PM

theorem 1 SSS Similarity theorem (Proof is not required)
If the side lengths of two triangles are in proportion, then the two triangles are similar.



side side side

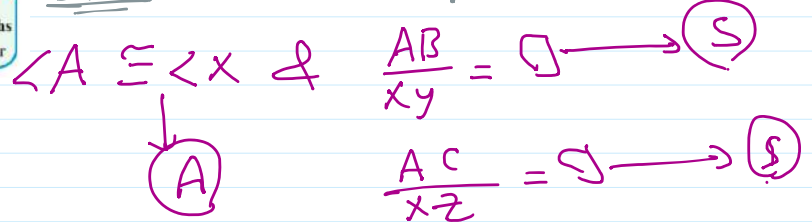
$\frac{AB}{XY} = \square$
 $BC = YZ$
 $AC = XZ$



theorem 2 SAS Similarity theorem (Proof is not required)
If an angle of one triangle is congruent to an angle of another triangle and lengths of the sides including those angles are in proportion, then the triangles are similar.

SAS

side Angle side



على خط واحد

5 In the figure opposite: B, Y and C are collinear. Prove that:

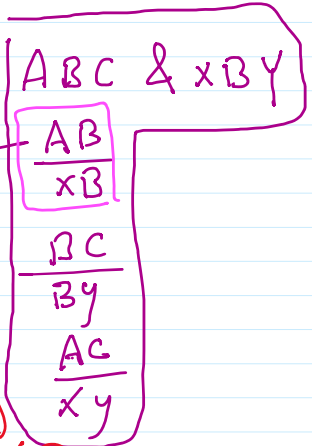
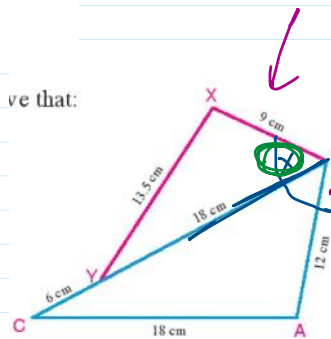
A $\triangle ABC \sim \triangle XBY$

B \overline{BC} bisects $\angle ABX$

SSS /

$\therefore \frac{AB}{XB} = \frac{12}{9} = \frac{4}{3} \rightarrow (1)$
 $\therefore \frac{BC}{BY} = \frac{12}{18} = \frac{2}{3} = \frac{4}{6} \rightarrow (2)$
 $\therefore \frac{AC}{XY} = \frac{18}{13.5} = \frac{4}{3} \rightarrow (3)$

ve that:



From (1), (2), (3) $\therefore \triangle ABC \sim \triangle XBY$

SSS theorem

$\therefore m(\angle A) = m(\angle X)$ & $m(\angle XBY) = m(\angle CBA)$ & $m(\angle C) = m(\angle Y)$ #1
 $\therefore \overline{BC}$ bisects $\angle ABX$ #2

7 ABC is a triangle AB = 8cm, AC = 10cm, BC = 12cm, E \in \overline{AB} where AE = 2cm, D \in \overline{BC} where BD = 4cm

A Prove that $\triangle BDE \sim \triangle BAC$ and deduce the length of \overline{DE} .

given
prove that
 $\triangle ABC \sim \triangle XYZ$

given
 $\triangle ABC \sim \triangle XYZ$
aa oc oc

7) ABC is a triangle AB = 8cm, AC = 10cm, BC = 12cm, E ∈ AB where AE = 2cm, D ∈ BC where BD = 4cm

- (A) Prove that $\triangle BDE \sim \triangle BAC$ and deduce the length of DE
 (B) Prove that figure ACDE is a cyclic quadrilateral.

$\therefore \frac{BD}{BA} = \frac{4}{8} = \frac{1}{2} \rightarrow \textcircled{1}$

$\therefore \frac{DE}{AC} = \frac{DE}{10} \rightarrow \textcircled{2}$

$\therefore \frac{BE}{BC} = \frac{6}{12} = \frac{1}{2} \rightarrow \textcircled{3}$

$\therefore \angle B$ is common angle

$\therefore \triangle BDE \sim \triangle BAC$ (SAS)

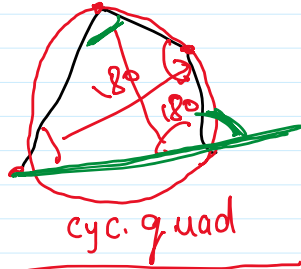
$\frac{DE}{10} = \frac{1}{2} \Rightarrow 2DE = \frac{10}{2} \Rightarrow DE = 5\text{cm}$

$\therefore m(\angle A) = m(\angle EDB)$
 $\therefore ACDE$ is cyclic quad.



Prove that $\triangle ABC \sim \triangle XYZ$
 $\frac{AB}{XY} = \square$
 $\frac{BC}{YZ} = \square$
 SSS
 SAS
 AA Postulate

$ABC \sim XYZ$
 $\therefore \frac{AB}{XY} = \frac{BC}{YZ} = \frac{AC}{XZ}$

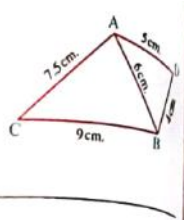


- (1) $m(\angle A) + m(\angle CDE) = 180$
 (2) $m(\angle C) + m(\angle AED) = 180$
 (3) $m(\angle A) = m(\angle EDB)$

SSS / SAS
 $\triangle ABC \sim \triangle XYZ$
 $m(\angle B) = m(\angle Y)$
 $m(\angle C) = m(\angle Z)$

5) In the opposite figure :

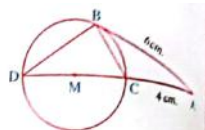
ABC is a triangle in which : AB = 6 cm, BC = 9 cm, AC = 7.5 cm, D is a point outside the triangle ABC where DB = 4 cm, DA = 5 cm. Prove that :
 (1) $\triangle ABC \sim \triangle DBA$ (2) BA bisects $\angle DBC$



(55) In the opposite figure :

If AB is a tangent to circle M, then the circumference of circle M = cm.

- (a) 4π (b) 5π
 (c) 6π (d) 9π



(56) In the opposite figure :

AD is a tangent to the circle, then the length of DB = cm.

- (a) 5 (b) 4
 (c) 6 (d) $6\frac{1}{4}$

