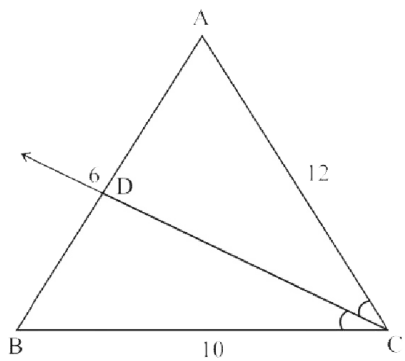
Exercise 14.2

Q.1 **In ΔABC as shown in the figure $\overrightarrow{CD}$ bisects ∠C and meets $\overline{AB}$ at D.$m\overline{BD}$ is equal to**

(a) 5 **(b)** 16 **(c)** 10 **(d)** 18



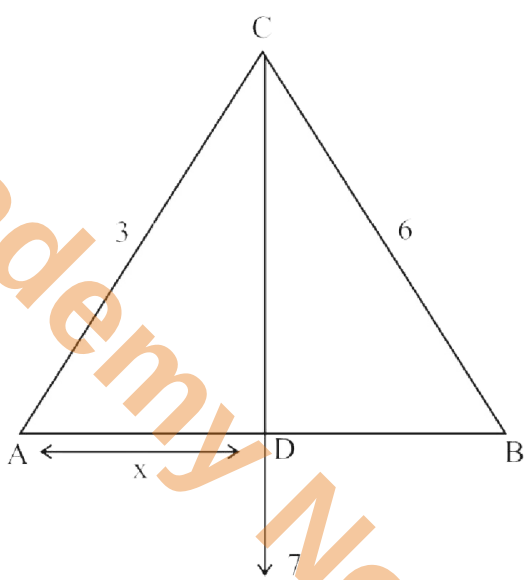
$$\frac{m\overline{BD}}{m\overline{DA}} = \frac{m\overline{BC}}{m\overline{CA}}$$

$$\frac{\overline{BD}}{6} = \frac{10}{12}$$

$$\overline{BD} = \frac{10^{5} \times 6^{2}}{12_{A_2}} \text{ or } \overline{BD} = \frac{10 \times 6}{12} = \frac{60^{5}}{12}$$

$$\overline{BD} = 5$$

Q.2 **In ΔABC shown in the figure $\overrightarrow{CD}$ bisects ∠C. If $m\overline{AC} = 3$, $\overline{CB} = 6$ and $m\overline{AB} = 7$ then find $m\overline{AD}$ and $\overline{DB}$**



$$\overline{AB} = \overline{AD} + \overline{BD}$$

$$\overline{AD} = \overline{AB} - \overline{BD}$$

$$\overline{AD} = 7 - x$$

$$\frac{m\overline{AD}}{m\overline{BD}} = \frac{m\overline{AC}}{m\overline{CB}}$$

$$\frac{x}{7-x} = \frac{3^{1}}{6_{2}}$$

$$\frac{x}{7-x} = \frac{1}{2}$$

$$2x = 7 - x$$

$$2x + x = 7$$

$$3x = 7$$

$$x = \frac{7}{3} \quad \text{or} \quad \overline{AD} = \frac{7}{3}$$

$$\overline{AB} = \overline{AD} + \overline{BD}$$

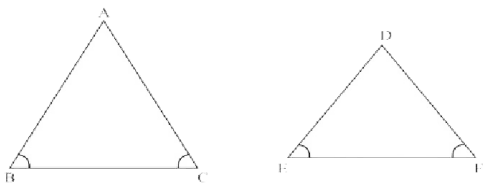
$$7 = \frac{7}{3} + \overline{BD}$$

$$7 - \frac{7}{3} = \overline{BD}$$

$$\frac{21-7}{3} = \overline{BD}$$

$$\overline{BD} = \frac{14}{3}$$

Q.3 Show that in any corresponding of two triangles if two angles of one triangle are congruent to the corresponding angles of the other, then the triangle are similar



Given

ΔABC and ΔDEF

$\angle B \cong \angle E$

$\angle C \cong \angle F$

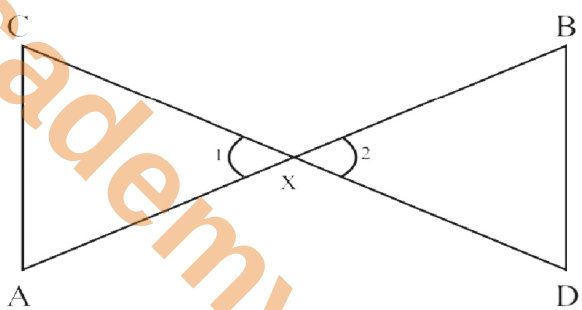
To Prove

$\Delta ABC \cong \Delta DEF$

Proof

Statements	Reasons
$\angle A + \angle B + \angle C = 180^\circ$ $\angle D + \angle E + \angle F = 180$ $\angle A \cong \angle D$ $\angle B = \angle E$ $\angle C = \angle F$ Hence $\Delta ABC \cong \Delta DEF$	Sume of three angles of a triangle = 180°

Q.4 If line segment $\overline{AB}$ and $\overline{CD}$ are intersecting at point X and $\frac{m\overline{AX}}{m\overline{XB}} = \frac{m\overline{CX}}{m\overline{XD}}$ then show that ΔAXC and ΔBXD are similar



Given

Line segment $\overline{AB}$ and $\overline{CD}$ intersect at X

$\frac{m\overline{AX}}{m\overline{XB}} = \frac{m\overline{CX}}{m\overline{XD}}$

To Prove

ΔCXA and ΔDXB are similar

Proof

Statements	Reasons
$\frac{\overline{AX}}{\overline{XB}} = \frac{\overline{CX}}{\overline{XD}}$	Given
$\angle 1 \cong \angle 2$	
$\overline{AC} \parallel \overline{BD}$	Vertical angles
$\angle A = m\angle B$	
$m\angle C = m\angle D$	Alternate angles
Hence proved the triangle are similar	