CHAPTER 7: TRIANGLES

EXERCISE 7.3

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

2. In Fig.7.4, **D** and **E** are the points on side **BC** of a $\triangle$**ABC** such that **BD** = **CE** and **AD** = **AE**. Show that $\triangle$**ABD** $\cong$ $\triangle$**ACE**.

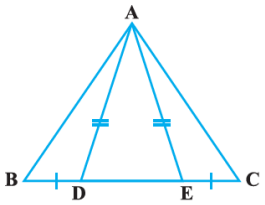

Figure 1: 7.4

3. **CDE** is an equilateral triangle formed on a side **CD** of a square **ABCD** (Fig.7.5). Show that $\triangle$**ADE** $\cong$ $\triangle$**BCE**.

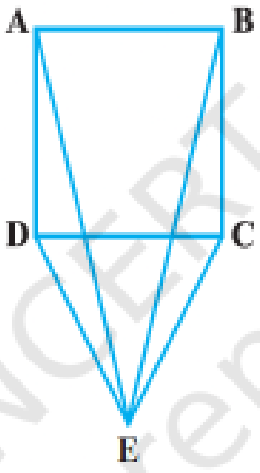

Figure 2: 7.5

4. In Fig.7.6, **BA** $\perp$ **AC**, **DE** $\perp$ **DF** such that **BA** = **DE** and **BF** = **EC**. Show that $\triangle$**ABC** $\cong$ $\triangle$**DEF**.

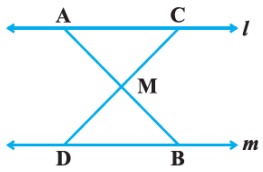

Figure 3: 7.6

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

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

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

8. In Fig.7.7, **l**$\|$**m** an **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.

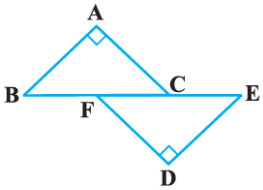

Figure 4: 7.7

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

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

11. In Fig.7.8, **AD** is the bisector of $\angle$**BAC**. Prove that **AB** $>$ **BD**.

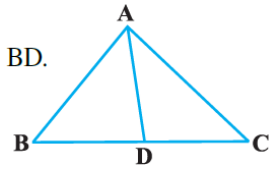

Figure 5: 7.8