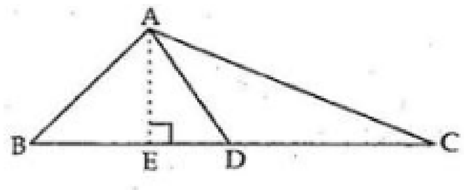
Exercise 10A

Question 23:

Given : ABC is a triangle in which AD is the median.

To Prove: $ar(\Delta ABD) = ar(\Delta ACD)$

Construction: Draw $AE \perp BC$



Proof: $ar(\Delta ABD) = \frac{1}{2} \times BD \times AE$

and, $ar(\Delta ADC) = \frac{1}{2} \times DC \times AE$

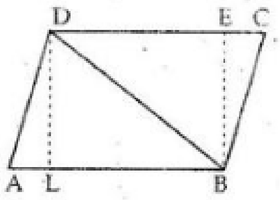
Since, $BD = DC$ [Since D is the median]

So, $ar(\Delta ABD) = \frac{1}{2} \times BD \times AE$

$= \frac{1}{2} \times DC \times AE = ar(\Delta ADC)$

$\therefore$ $ar(\Delta ABD) = ar(\Delta ACD)$

Question 24:



Given : ABCD is a parallelogram in which BD is its diagonal.

To Prove: $ar(\Delta ABD) = ar(\Delta BCD)$

Construction : Draw $DL \perp AB$ and $BE \perp CD$

Proof: $ar(\Delta ABD) = \frac{1}{2} \times AB \times DL$ .....(i)

and, $ar(\Delta CBD) = \frac{1}{2} \times CD \times BE$ .....(ii)

Now, since ABCD is a parallelogram.

$\therefore$ $AB \parallel CD$

and $AB = CD$ .....(iii)

Since distance between two parallel lines is constant,

$\Rightarrow$ $DL = BE$ .....(iv)

Form (i),(ii) , (iii), and (iv) we have

$$ar(\Delta ABD) = \frac{1}{2} \times AB \times DL$$

$$= \frac{1}{2} \times CD \times BE = ar(\Delta CBD)$$

$\therefore$ $ar(\Delta ABD) = ar(\Delta CBD)$

*********** END **********