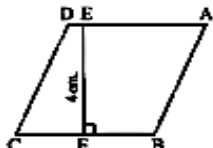
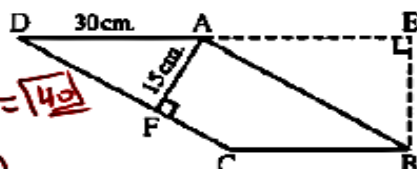
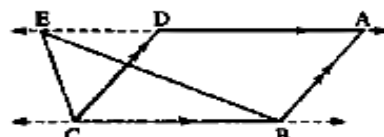
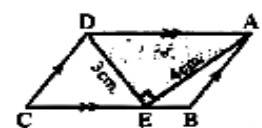
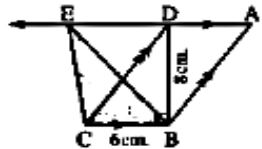


## Lesson 1

## The equality of areas of parallelogram

**Complete each of the following :**

١. If the area of  $\square ABCD = 400 \text{ cm}^2$ ,  
then  $BC = \dots\dots\dots \text{ cm}$ .  $BC = \frac{400}{4} = 100$
- 
٢. If the area of  $\square ABCD = 600 \text{ cm}^2$ ,  
then  $CD = \dots\dots\dots \text{ cm}$ ,  $CD = \frac{600}{15} = 40$   
 $BE = \dots\dots\dots \text{ cm}$ .  $BE = \frac{600}{30} = 20$
- 
٣. In the opposite figure :  
ABCD is a parallelogram and  $E \in \overline{AD}$   
Complete the following :  
1 The area of  $\triangle EBC = \frac{1}{2}$  the area of  $\square ABCD$   
2 If the area of  $\triangle EBC = 20 \text{ cm}^2$ , then the area of  $\square ABCD = 40 \text{ cm}^2$
- 
٤. In the opposite figure :  
ABCD is a parallelogram ,  $AE = 4 \text{ cm}$  ,  $ED = 3 \text{ cm}$  ,  
 $m(\angle AED) = 90^\circ$  and  $E \in \overline{BC}$  Complete :  
1 The area of  $\triangle AED = \frac{1}{2} \times 4 \times 3 = 6 \text{ cm}^2$   
2 The area of  $\square ABCD = 2 \times 6 = 12 \text{ cm}^2$
- 
٥. In the opposite figure :  
ABCD is a parallelogram in which ,  $BC = 6 \text{ cm}$  ,  $\overline{DB} \perp \overline{BC}$  ,  
such that ,  $DB = 8 \text{ cm}$  and  $E \in \overline{AD}$   
Complete :  
1 The area of  $\square ABCD = 6 \times 8 = 48 \text{ cm}^2$   
2 The area of  $\triangle EBC = \frac{1}{2} \times 48 = 24 \text{ cm}^2$
- 

**Choose the correct answer :**

1. If the base length of a parallelogram is 7 cm. and the corresponding height is 4 cm. , then its area = .....  $7 \times 4 = 28 \text{ cm}^2$   
 (a) 11 cm<sup>2</sup> (b) 14 cm<sup>2</sup> (c) 22 cm<sup>2</sup> (d) 28 cm<sup>2</sup>

2. If the area of a parallelogram is 35 cm<sup>2</sup> and its height is 5 cm. , then the length of the corresponding base is .....  $\frac{35}{5} = 7$   
 (a) 5 cm. (b) 7 cm. (c) 9 cm. (d) 30 cm.

3. If ABCD is a parallelogram in which , AB = 5 cm. , BC = 10 cm. and its smaller height is 4 cm. , then its greater height = .....  
 (a) 2 cm. (b) 4 cm. (c) 8 cm. (d) 10 cm.

4. A parallelogram whose area = 50 cm<sup>2</sup> and the length of its base equals twice the corresponding height , then this height = .....  
 (a) 50 cm. (b) 25 cm. (c) 10 cm. (d) 5 cm.

5. The ratio between the area of the parallelogram and the area of the triangle whose base is common and are included between two parallel straight lines = .....  
 (a) 1 : 2 (b) 1 : 3 (c) 2 : 1 (d) 2 : 3

6. If the area of the triangle is 42 cm<sup>2</sup> and its height = 7 cm. , then the length of the corresponding base = .....  
 (a) 15 cm. (b) 12 cm. (c) 8 cm. (d) 4 cm.

$$\begin{aligned} \text{Area} &= 4 \times 10 = 40 \\ \text{greater height} &= \frac{40}{5} = 8 \end{aligned}$$

$$\begin{aligned} b &= 2h \\ 2h \cdot h &= 50 \\ \frac{2h^2}{2} &= \frac{50}{2} \\ h^2 &= 25 \\ h &= 5 \end{aligned}$$

$$\begin{aligned} b &= \frac{2A}{h} \\ &= \frac{2 \times 42}{7} \\ &= 12 \end{aligned}$$

- v. The area of a right-angled triangle in which the lengths of the sides of the right angle are 6 cm. and 9 cm. equals .....  $\frac{1}{2} \times 6 \times 9 = 3 \times 9 = 27$
- (a)  $54 \text{ cm}^2$  (b)  $60 \text{ cm}^2$  (c)  $27 \text{ cm}^2$  (d)  $15 \text{ cm}^2$
- 
- Λ. The area of the rectangle whose dimensions are 6 cm. and 4 cm.  $6 \times 4 = 24$  the area of the triangle whose base length is 12 cm. and the corresponding height is 4 cm.  $\frac{1}{2} \times 12 \times 4 = 24$
- (a) < (b) > (c) = (d) ≠

### Essay problems:

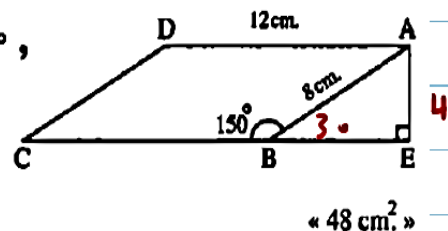
In the opposite figure :

ABCD is a parallelogram in which  $m(\angle ABC) = 150^\circ$  ,

$AD = 12 \text{ cm}$ .

,  $AB = 8 \text{ cm}$  ,  $E \in \overrightarrow{CB}$  and  $\overline{AE} \perp \overrightarrow{CB}$

Find : The area of  $\square ABCD$



$$m \angle ABE = 180 - 150 = 30^\circ$$

$$\therefore AE = \frac{1}{2} AB = \frac{1}{2} \times 8 = 4 \text{ cm}$$

$$\therefore \text{Area of } \square ABCD = 12 \times 4 = 48 \text{ cm}^2$$

4)

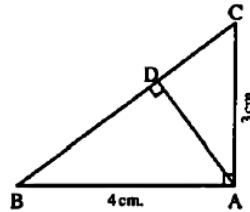
In the opposite figure :

ABC is a right-angled triangle at A ,

$\overline{AD} \perp \overline{BC}$  , AB = 4 cm. and AC = 3 cm.

Find : 1 The area of  $\Delta ABC$

2 The length of  $\overline{AD}$



$$\begin{aligned} \Delta ABC &= \frac{1}{2} \times 4 \times 3 \\ &= 2 \times 3 \\ &= 6 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} AB^2 &= AC^2 + BC^2 \\ AB^2 &= 16 + 9 = 25 \\ AB &= \sqrt{25} = 5 \text{ cm} \end{aligned}$$

$$\therefore AD = \frac{2 \Delta}{B} = \frac{2 \times 6}{5} = \frac{12}{5} = 2.4 \text{ cm}$$

8)

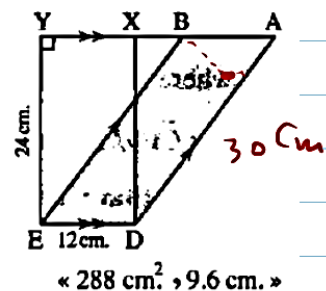
In the opposite figure :

$\overline{AB} \parallel \overline{DE}$  , X and Y  $\in \overline{AB}$

, XDEY is a rectangle and  $\overline{AD} \parallel \overline{BE}$

1 Find the area of the figure ABED =  $12 \times 24 = 288 \text{ cm}^2$

2 If : AD = 30 cm. , find the length of the perpendicular from B to  $\overline{AD}$



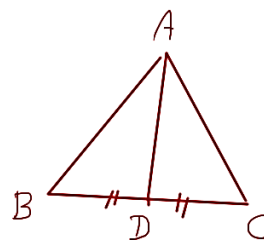
$$= \frac{288}{30} = 9.6 \text{ cm}$$

## Lesson 2

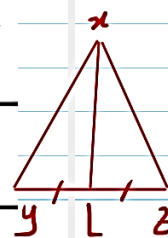
### The equality of the areas of two triangles

**Complete each of the following :**

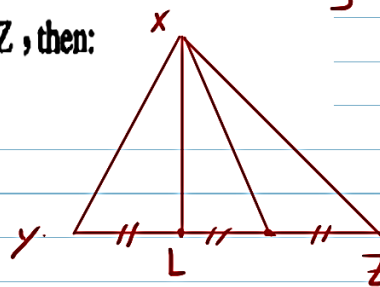
1. If  $ABC$  is a triangle,  $D$  is the midpoint of  $\overline{BC}$ , then :  
The area of  $\triangle ABD$  = the area of  $\triangle \dots$   $\triangle ACD$



2. If  $\overline{XL}$  is a median in  $\triangle XYZ$ , then the area of  $\triangle XYZ$  =  $\dots$   $2$   $\dots$  the area of  $\triangle XYL$



3. The triangle  $XYZ$  in which  $L \in \overline{YZ}$  such that  $YL = \frac{1}{2} LZ$ , then:  
The area of  $\triangle XYL$  =  $\dots$   $\frac{1}{3}$   $\dots$  the area of  $\triangle XYZ$



4. The two triangles drawn on a common base and their vertices located on a straight line parallel to the base are  $\dots$  equal in area

5. Triangles with congruent bases and drawn between two parallel lines are  $\dots$  equal in area

6. The median in the triangle divides its area into  $\dots$  two triangles equal in area