# Chapter 2

# Measurements

Ex 2.1

Question 1. Find the area and perimeter of the following parallelograms.



#### Solution:

(i) Given base b = 11 cm; height h = 3 cmArea of the parallelogram  $= b \times h \text{ sq. units} = 11 \times 3 \text{ cm}^2$  $= 33 \text{ cm}^2$ Also perimeter of a parallelogram = Sum of 4 sides= 11 cm + 4 cm + 11 cm + 4 cm = 30 cmArea  $= 33 \text{ cm}^2$ ; Perimeter = 30 cm.

(ii) Given base b = 7 cmheight h = 10 cmArea of the parallelogram  $= b \times h \text{ sq. units}$  $= 7 \times 10 \text{ cm}^2 = 70 \text{ cm}^2$ Perimeter = Sum of four sides= 13 cm + 7 cm + 13 cm + 7 cm = 40 cmArea  $= 70 \text{ cm}^2$ , Perimeter = 40 cm

#### Question 2. Find the missing values.

S.No.	Base	Height	area	
(i)	18 <i>cm</i>	5 <i>cm</i>		
(ii)	8 <i>m</i>		56 <i>sq.m</i>	
(iii)		17 mm	221 <i>sq.mm</i>	

# Solution:

(i) Given Base 6 = 18 cm ; Height h = 5 cm Area of the parallelogram =  $b \times h$  sq. units  $= 18 \times 5 \text{ cm}^2$  $= 90 \text{ cm}^2$ 

(ii) Base b = 8m; Area of the parallelogram = 56 sq. m  $b \times h = 56$   $8 \times A = 56$  h = 568h = 7 m

(iii) Given Height h = 17 mmArea of the parallelogram = 221 sq. mm  $b \times h = 221$  $b \times 17 = 221$ b = 22117b = 13 mTabulating the results, we get

S.No.	Base	Height	Area
(i)	18 cm	5 cm	-
(ii)	8 m		56 sq. m
(iii)	-	17 mm	221 sq. mm

Question 3.

Suresh on a parallelogram shaped trophy in a state level chess tournament. He knows that the area of the trophy is 735 sq. cm and its base is 21 cm. What is the height of that trophy?



Solution: Given base 6 = 21 cmArea of parallelogram = 735 sq. cm  $b \times h = 735$   $21 \times h = 735$  h = 73521 h = 35 cm $\therefore$  Height of the trophy = 35 cm Question 4.

Janaki has a piece of fabric in the shape of a parallelogram. Its height is 12 m and its base is 18 m. She cuts the fabric into four equal parallelograms by cutting the parallel sides through its mid-points. Find the area of each new parallelogram.

Solution:



Area of a parallelogram = (base × height) sq. units Base length = 182 = 9 m Height = 122 = 6 m Area =  $9 \times 6 = 54$  m<sup>2</sup> Area of each parallelogram = 54 m<sup>2</sup>

Question 5.

A ground is in the shape of parallelogram. The height of the parallelogram is 14 metres and the corresponding base is 8 metres longer than its height. Find the cost of levelling the ground at the rate of  $\gtrless$  15 per sq. m.

Solution:



Height of the parallelogram h = 14 mBase = 8 m longer than height = (14 + 8) m = 22 mArea of the parallelogram = (base × height) sq. units =  $(22 \times 14)m^2 = 308 m^2$  Cost of levelling  $1 \text{ m}^2 = \text{\ensuremath{\bar{1}}} 15$ Cost of levelling  $308 \text{ m}^2 = 308 \times 15 = \text{\ensuremath{\bar{1}}} 4,620$ Cost of levelling the ground  $= \text{\ensuremath{\bar{1}}} 4,620$ 

#### **Objective Type Questions**

#### Question 6.

The perimeter of a parallelogram whose adjacent sides are 6 cm and 5 cm is (i) 12 cm (ii) 10 cm

(ii) 10 cm (iii) 24 cm (iv) 22 cm

#### Solution:

(iv) 22 cm Hint: =  $2(6+5) = 2 \times 11 = 22$  cm

#### Question 7.

#### The area of parallelogram whose base 10 m and height 7 m is

(i) 70 sq.m (ii) 35 sq.m (iii) 7 sq.m (iv) 10 sq.m

#### Solution:

(i) 70 sq. m Hint: = base × height =  $10m \times 7m = 70$  sq.m

#### Question 8.

The base of the parallelogram with area is 52 sq. cm and height 4 cm is (i) 48 cm (ii) 104 cm (iii) 13 cm (iv) 26 cm

#### Solution:

(iii) 13 cm Hint: base =  $\frac{\text{area}}{\text{height}} = \frac{52 \text{sq.cm}}{4 \text{cm}} = 13 \text{cm}$ 

#### Question 9.

What happens to the area of the parallelogram if the base is increased 2 times

#### and the height is halved?

(i) Decreases to half(ii) Remains the same(iii) Increase by two times(iv) None

#### Solution:

(ii) Remains the same Hint: Area =  $b \times h$  sq. units New base =  $2 \times old$  base New height =  $12 \times old$  height New Area = New base  $\times$  New height =  $(2 \times b)12 \times h = bh = old$  Area.

#### Question 10.

In a parallelogram the base is three times its height. If the height is 8 cm then the area is

(i) 64 sq. cm (ii) 192 sq. cm (iii) 32 sq. cm (iv) 72 sq. cm

#### Solution:

(ii) 192 sq. cm Hint: Given  $b = 3 \times h$ ; h = 8 cm Area =  $b \times h = 3h \times 8 = 3 \times 8 \times 8 = 192$  cm<sup>2</sup>

#### Ex 2.2

Question 1. Find the area of rhombus PQRS shown in the following figures.



#### Solution:

(i) Given the diagonals  $d_1 = 16 \text{ cm}$ ;  $d_2 = 8 \text{ cm}$ Area of the rhombus =  $12(d_1 \times d_2)$  sq. units  $= 12 \times 16 \times 8 \text{ cm}^2 = 64 \text{ cm}^2$ Area of the rhombus = 64 cm<sup>2</sup>

(ii) Given base b = 15 cm; Height h = 11 cmArea of the rhombus = (base × height) sq. units  $= 15 \times 11 \text{ cm}^2 = 165 \text{ cm}^2$ Area of the rhombus = 165 cm<sup>2</sup>

# Question 2. Find the area of a rhombus whose base is 14 cm and height is 9 cm.

Solution:



Given base b = 14 cm; Height h = 9 cmArea of the rhombus  $= b \times h$  sq. units  $= 14 \times 9 \text{ cm}^2 = 126 \text{ cm}^2$ 

#### Question 3. Find the missing value.

S.No.	Diagonal ( $d_1$ )	Diagonal ( $d_2$ )	Area
(i)	19 cm	16 cm	
(ii)	26 m		468 sq. m
(iii)		12 <i>mm</i>	180 sq. mm

# Solution:

(i) Given diagonal  $d_1 = 19$  cm ;  $d_2 = 16$  cm Area of the rhombus =  $12(d_1 \times d_2)$  sq. units =  $12 \times 19 \times 16$ = 152 cm<sup>2</sup>

(ii) Given diagonal  $d_1 = 26$  m ; Area of the rhombus = 468 sq. m =  $12(d_1 \times d_2) = 468$  ;  $(26 \times d_2) = 468 \times 2$  $d_2 = 468 \times 226 = d_2 = 36$  m

(iii) Given diagonal  $d_2 = 12$  mm; Area of the rhombus = 180 sq. m  $12(d_1 \times d_2) = 180$   $12(d_1 \times 12) = 180$   $d_1 \times 12 = 180 \times 2$   $d_1 = 180 \times 212$  $d_1 = 30$  mm Diagonal  $d_1 = 30 \text{ mm}$ Tabulating the results we have

S.No.	Diagonal $(d_1)$	Diagonal (d <sub>2</sub> )	Area
(i)	19 cm	16 cm	152 sq. cm
(ii)	26 m	36 m	468 sq. m
(iii)	30 mm	12 mm	180 sq. mm

Question 4.

The area of a rhombus is 100 sq. cm and length of one of its diagonals is 8 cm. Find the length of the other diagonal.

Solution:

Given the length of one diagonal  $d_1=8\ \text{cm}$  ; Area of the rhombus = 100 sq. cm  $12(d_1\times d_2)=100$ 

 $\begin{array}{l} 12\times8\times d_2=100\\ 8\times d_2=100\times2\\ d_2=100\times28=25\ \text{cm}\\ \text{Length of the other diagonal } d_2=25\ \text{cm} \end{array}$ 

Question 5.

A sweet is in the shape of rhombus whose diagonals are given as 4 cm and 5 cm. The surface of the sweet should be covered by an aluminum foil. Find the cost of aluminum foil used for 400 such sweets at the rate of  $\gtrless$  7 per 100 sq. cm.

Solution: Diagonals  $d_1 = 4 \text{ cm}$  and  $d_2 = 5 \text{ cm}$ Area of one rhombus shaped sweet =  $12(d_1 \times d_2)$  sq. units =  $12 \times 4 \times 5 \text{ cm}^2 = 10 \text{ cm}^2$ Aluminum foil used to cover 1 sweet =  $10 \text{ cm}^2$   $\therefore$  Aluminum foil used to cover 400 sweets =  $400 \times 10 = 4000 \text{ cm}^2$ Cost of aluminum foil for  $100 \text{ cm}^2 = \text{₹} 7$   $\therefore$  Cost of aluminum foil for  $4000 \text{ cm}^2 = 4000100 \times 7 = \text{₹} 280$  $\therefore$  Cost of aluminum foil used = ₹ 280.

# **Objective Type Questions**

Question 6. The area of the rhombus with side 4 cm and height 3 cm is (i) 7 sq. cm (ii) 24 sq. cm (iii) 12 sq. cm (iv) 10 sq. cm

#### Solution:

(iii) 12 sq. cm Hint: Area = Base × Height =  $4 \times 3 = 12$  cm<sup>2</sup>

#### Question 7.

#### The area of the rhombus when both diagonals measuring 8 cm is

(i) 64 sq. cm (ii) 32 sq. cm (iii) 30 sq. cm (iv) 16 sq. cm

#### Solution:

(ii) 32 sq. cm Hint: Area = 12(d1 × d2) = 12 × 8 × 8 = 32

#### Question 8.

The area of the rhombus is 128 sq. cm. and the length of one diagonal is 32 cm. The length of the other diagonal is

(i) 12 cm (ii) 8 cm (iii) 4 cm (iv) 20 cm

#### Solution:

(ii) 8 cm Hint:  $12 \times d_1 \times d_2 = 128 \Rightarrow d_2 = 128 \times 232 = 8$ cm

#### Question 9.

The height of the rhombus whose area 96 sq. m and side 24 m is (i) 8 m (ii) 10 m (iii) 2 m (iv) 4 m

#### Solution:

(iv) 4 m Hint: Area = Base × height =  $96 \Rightarrow$  height = 9624 = 4

# Question 10. The angle between the diagonals of a rhombus is (i) 120° (ii) 180° (iii) 90° (iv) 100°

# Solution:

(iii) 90°Hint:Angles of a rhombus bisect at right angles.

# Ex 2.3

# Question 1. Find the missing values.

S.No.	Height 'h'	Parallel side 'a'	Parallel side 'b'	Area
(i)	10 <i>m</i>	12 <i>m</i>	20 <i>m</i>	
(ii)		13 <i>cm</i>	28 cm	492 sq. cm
(iii)	19 <i>m</i>		16 <i>m</i>	323 sq. m
(iv)	16 <i>cm</i>	15 <i>cm</i>		360 sq. cm

# Solution:

(i) Given Height h = 10 m ; Parallel sides a = 12 m ; b = 20 m Area of the Trapezium = 12h(a + b) sq. units =  $12 \times 10 \times (12 + 20)m^2$ =  $(5 \times 32)m^2 = 160 m^2$ 

(ii) Given the parallel sides a = 13 cm ; 6 = 28 cm Area of the trapezium = 492 sq. cm 12h(a + b) = 492 $12 \times h \times (13 + 28) = 492$  $h \times 41 = 492 \times 2$  $h = 492 \times 241$ h = 24 cm

(iii) Given height 'h' = 19 m; Parallel sides b = 16 m Area of the trapezium = 323 sq. m 12h(a + b) = 323 $12 \times h \times (a + 16) = 323$  $a + 16 = 323 \times 219 = 34$  a = 18 m (iv) Given the height h- 16 cm ; Parallel sides a = 15 cm Area of the trapezium = 360 sq. cm  $12 \times h \times (a + b) = 360$   $12 \times 16 \times (15 + 6) = 360$  15 + b = 3608 = 45 b = 45 - 15 = 30 b = 30 cm Tabulating the results we get

S.No.	Height 'h'	Parallel side 'a'	Parallel side 'b'	Area
(i)	10 cm	12 m	20 m	160 m <sup>2</sup>
(ii)	24 cm	13 cm	28 cm	492 sq. cm
(iii)	19 m	18 m	16 m	323 sq. m
(iv)	16 cm	15 cm	30 cm	360 sq. cm

Question 2.

a = 34 - 16 = 18 m

Find the area of a trapezium whose parallel sides are 24 cm and 20 cm and the distance between them is 15 cm.

Solution:

Given the parallel sides a = 24 cm; b = 20 cm



Distance between a and b is 'h' = 15 cm Area of the trapezium =  $12 \times h \times (a + b)$  sq. units =  $12 \times 15 \times (24 + 20)$  cm<sup>2</sup> =  $12 \times 15 \times 44 = 330$  cm<sup>2</sup> Area of the trapezium = 330 cm<sup>2</sup>

Question 3.

The area of a trapezium is 1586 sq. cm. The distance between its parallel sides is 26 cm. If one of the parallel sides is 84 cm then find the other side. Solution:

Given one parallel side = 84 cm. Let the other parallel side be 'b' cm.

Distance between a and b is h = 26 cm. Area of the trapezium = 1586 sq. cm

$$\frac{1}{2} \times h \times (a+b) = 1586$$
  
$$\frac{1}{2} \times 26^{13} \times (84+b) = 1586$$
  
$$84+b = \frac{1586}{13}$$
  
$$84+b = 122$$
  
$$b = 122 - 84 = 38 \text{ cm}$$

 $\therefore$  The other parallel side = 38 cm.

#### Question 4.

The area of a trapezium is 1080 sq. cm. If the lengths of its parallel sides are 55.6 cm and 34.4 cm. Find the distance between them.

#### Solution:

Length of the parallel sides a = 55.6 cm; b = 34.4 cmArea of the trapezium = 1080 sq. cm

$$\frac{1}{2} \times h \times (a+b) = 1080$$
$$\frac{1}{2} \times h \times (55.6 + 34.4) = 1080$$
$$\frac{1}{2} \times h \times 90.0 = 1080$$
$$h = \frac{1080}{45} = 24 \text{ cm}$$

Distance between parallel sides = 24 cm.

#### Question 5.

The area of a trapezium is 180 sq. cm and its height is 9 cm. If one of the parallel sides is longer than the other by 6 cm. Find the length of the parallel sides.

#### Solution:

Let one of the parallel side be 'a' cm. Given one parallel sides is longer than the other by 6 cm.

i.e. b = a + 6 cm Also given height 'h' = 9 cm

Area of trapezium = 180 sq. cm

$$\frac{1}{2} \times h \times (a+b) = 180 \text{ cm}^2$$
  
$$\frac{1}{2} \times 9 \times (a+a+6) = 180$$
  
$$\frac{1}{2} \times 9 \times (2a+6) = 180$$
  
$$2a+6 = \frac{180 \times 2}{9} = 20 \times 2$$
  
$$2a+6 = 40$$
  
$$2a = 40 - 6 = 34$$
  
$$a = 342 = 17 \text{ cm}$$
  
$$b = a + 6 = 17 + 6 = 23 \text{ cm}$$
  
$$\therefore \text{ The parallel sides are a} = 17 \text{ cm and } b = 23 \text{ cm}$$

#### Question 6.

The sunshade of a window is in the form of isoceles trapezium whose parallel sides are 81 cm and 64 cm and the distance between them is 6 cm. Find the cost of painting the surface at the rate of  $\gtrless$  2 per sq. cm.

#### Solution:

Given the parallel sides a = 81 cm; b = 64 cmDistance between 'a' and 'b' is height h = 6 cmArea of the trapezium  $= 12 \times h(a + b)$  sq. units  $= 12 \times 6^3 \times (81 + 64) = 3 \times 145 \text{ cm}^2 = 435 \text{ cm}^2$ Cost of painting  $1 \text{ cm}^2 = \text{\ensuremath{\amath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\amath{\amath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\amath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\cnsuremath{\ensuremath{\ensuremath$ 

#### Question 7.

A window is in the form of trapezium whose parallel sides are 105 cm and 50 cm respectively and the distance between the parallel sides is 60 cm. Find the cost of the glass used to cover the window at the rate of  $\gtrless$  15 per 100 sq. cm.

#### Solution:

Given the parallel sides a = 105 cm ; b = 50 cm ; Height = 60 cm Area of the trapezium =  $12 \times h \times (a + b)$ sq. units =  $12 \times 60 \times (105 + 50)$  cm<sup>2</sup> =  $30 \times 155$  cm<sup>2</sup> = 4650 cm<sup>2</sup> For 100 cm<sup>2</sup> cost of glass used = ₹15  $\therefore$  For 4650 cm<sup>2</sup> cost of glass =  $₹4650100 \times 15 = ₹697.50$ Cost of the glass used = ₹697.50

# **Objective Type Questions**

# Question 8.

# The area of the trapezium, if the parallel sides are measuring 8 cm and 10 cm and the height 5 cm is

(i) 45 sq. cm (ii) 40 sq. cm (iii) 18 sq. cm (iv) 50 sq. cm

# Solution:

(i) 45 sq. cm Hint:  $12 \times h \times (a + b) = 12 \times 5 \times (10 + 8) = 45$ 

# Question 9.

In a trapezium if the sum of the parallel sides is 10 m and the area is 140 sq.m, then the height is

(i) 7 cm (ii) 40 cm (iii) 14 cm (iv) 28 cm

# Solution:

(iv) 28 cm Hint: Area =  $12 \times h \times (a + b) = 140 = 12 \times h \times 10 \Rightarrow h = 28$ 

# Question 10.

# When the non-parallel sides of a trapezium are equal then it is known as

(i) a square(ii) a rectangle(iii) an isoceles trapezium(iv) a parallelogram

Solution: (iii) an isoceles trapezium

# Ex 2.4

**Miscellaneous Practice Problems** 

Question 1. The base of the parallelogram is 16 cm and the height is 7 cm less than its base. Find the area of the parallelogram.

**Solution:** In a parallelogram Given base b = 16 cm; height h = base - 7 cm = 16 - 7 = 9 cm Area of the parallelogram = (base × height) sq. units =  $16 \times 9$  cm<sup>2</sup> = 144 cm<sup>2</sup> Area of the parallelogram = 144 cm<sup>2</sup>

# Question 2.

An agricultural field is in the form of a parallelogram, whose area is 68.75 sq. hm. The distance between the parallel sides is 6.25 cm. Find the length of the base.

Solution: Height of the parallelogram = 6.25 hm Area of the parallelogram = 68.75 sq. hm b × h = 68.75b × 6.25 = 68.75b = 68.75/6.25 = 6875/625 = 11 km Length of the base = 11 km.

Question 3.

A square and a parallelogram have the same area. If the side of the square is 48m and the height of the parallelogram is 18 m. Find the length of the base of the parallelogram.

Solution: Given side of the square is 48 m Area of the square = (side × side) sq. unit =  $48 \times 48 \text{ m}^2$ Height of the parallelogram = 18 mArea of the parallelogram = 'bh' sq. units =  $b \times 18 \text{ m}^2$ Also area of the parallelogram = Area of the square  $b \times 18 = 48 \times 48$   $b = 48 \times 48/18 = 8 \times 16 = 128 \text{ m}$ Base of the parallelogram = 128 m

Question 4. The height of the parallelogram is one fourth of its base. If the area of the parallelogram is 676 sq. cm, find the height and the base.

#### Solution:

Let the base of the parallelogram be 'b' cm Given height =  $1/4 \times base$ ; Area of the parallelogram = 676 sq. cm  $b \times h = 676$   $b \times 1/4b = 676$   $b \times b = 676 \times 4$  $b \times b = 13 \times 13 \times 4 \times 4$   $b = 13 \times 4 \text{ cm} = 52 \text{ cm}$ Height = 14 × 52 cm = 13 cm Height = 13 cm, Base 52 cm

Question 5.

The area of the rhombus is 576 sq. cm and the length of one of its diagonal is half of the length of the other diagonal then find the length of the diagonal.

# Solution:

Let one diagonal of the rhombus =  $d_2$  cm The other diagonal  $d_2 = 12 \times d_1$  cm Area of the rhombus = 576 sq. cm  $1/2 \times (d_1 \times d_2) = 576$   $1/2 \times (d_1 \times 12 d_1) = 576$   $d_1 \times d_1 = 576 \times 2 \times 2 = 6 \times 6 \times 4 \times 4 \times 2 \times 2$   $d_1 \times d_1 = \underline{6 \times 4 \times 2} \times \underline{6 \times 4 \times 2}$   $d_1 = 6 \times 4 \times 2$   $d_1 = 6 \times 4 \times 2$   $d_1 = 48$  cm  $d_2 = 1/2 \times 48 = 24$  cm  $\therefore$  Length of the diagonals  $d_1 = 48$  cm and  $d_2 = 24$  cm.

#### Question 6.

A ground is in the form of isoceles trapezium with parallel sides measuring 42 m and 36 m long. The distance between the parallel sides is 30 m. Find the cost of levelling it at the rate of ₹ 135 per sq. m.

# Solution:

Parallel sides of the trapezium a = 42 m; b = 36 mAlso height h = 30 mArea of the trapezium  $= 1/2 \times h \times (a + b)$  sq. unit  $= 1/2 \times 30 \times (42 + 36) \text{ m}^2$  $= 1/2 \times 30 \times 78 \text{ m}^2$ Area  $= 1,170 \text{ m}^2$ Cost of levelling  $1 \text{ m}^2 = \text{ f } 135$  $\therefore$  Cost of levelling  $1170 \text{ m}^2 = \text{ f } 1170 \times 135 = \text{ f } 1,57,950$ Cost of levelling the ground = f 1,57,950

# **Challenge Problems**

Question 7.

In a parallelogram PQRS (See the diagram) PM and PN are the heights corresponding to the sides QR and RS respectively. If the area of the parallelogram is 900 sq. cm and the length of PM and PN are 20 cm and 36 cm respectively, find the length of the sides QR and SR.



#### Solution:

Considering QR as base of the parallelogram height  $h_1 = 20 \text{ cm}$ Area of the parallelogram = 900 cm<sup>2</sup>  $b_1 \times h_1 = 900$ ;  $b_1 \times 20 = 900$  $b_1 = 900/20 = 45 \text{ cm}$ Again considering SR as base height = 36 cm; Area = 900 cm<sup>2</sup>  $b_2 \times h_2 = 900$ ;  $b_2 \times 36 = 900$  $b_2 = 900/36$  $b_2 = 25 \text{ cm}$ SR = 25 cm; QR = 45 cm; SR = 25 cm

#### Question 8.

If the base and height of a parallelogram are in the ratio 7:3 and the height is 45 cm, then fixed the area of the parallelogram.

#### Solution:

Given base; height = 7 : 3 Let base = 7x cm height = 3x cm also given height = 45 cm 3x = 45 cm 45. x = 45/3 = 15Now base = 7x cm = 7 × 15 cm = 105 cm Area of the parallelogram = b × h sq. unit = 105 × 45 = 4725 cm<sup>2</sup> = 4725 cm<sup>2</sup>

Question 9. Find the area of the parallelogram ABCD if AC is 24 cm and BE = DF = 8 cm.

#### Solution:

Area of the parallelogram ABCD Area of the triangle =Area of the triangle ABC + Area of the triangle ADC

Area of the triangle  $=\frac{1}{2} \times (base \times height)$  sq. units Area of  $\triangle ABC$   $=\frac{1}{2} \times \overset{12}{24} \times 8 \text{ cm}^2 = 96 \text{ cm}^2$ Area of  $\triangle ADC$   $=\frac{1}{2} \times \overset{12}{24} \times 8 \text{ cm}^2 = 96 \text{ cm}^2$ 

Area of the parallelogram  $ABCD = 96 + 96 = 192 \text{ cm}^2$ 

Question 10.

The area of the parallelogram ABCD is 1470 sq. cm. If AB = 49 cm and AD = 35 cm then, find the height, DF and BE.



#### Solution:

Area of the parallelogram = 1470 sq. cm Considering AB = base = 49 cm height = DF Area = base × height  $49 \times DF = 1470$ DF = 1470/49 DF = 30 cm Now considering AD as base Base = AD = 35 cm ; height = BE Base × Height = 1470  $35 \times BE = 1470 : BE = 1470/35$ BE = 42 cm ; DF = 30 cm ; BE = 42 cm

Question 11.

One of the diagonals of a rhombus is thrice as the other. If the sum of the length of the diagonals is 24 cm, then find the area of the rhombus.

# Solution:

Let one of the diagonals of rhombus be 'd<sub>1</sub>' cm and the other be d<sub>2</sub> cm. Give  $d_1 = 3 \times d_2$ Also  $d_1 + d_2 = 24$  cm  $\Rightarrow 3d_2 + d_2 = 24$   $4d_2 = 24$   $d_2 = 24/4$  $d_2 = 6$  cm  $\begin{array}{l} d_1 = 3 \times d_2 = 3 \times 6 \\ d_1 = 18 \text{ cm} \\ \therefore \text{ Area of the rhombus} = 1/2 \times d_1 \times d_2 \text{ sq. units} \\ = 1/2 \times 18 \times 6 \text{ cm}^2 = 54 \text{ cm}^2 \\ \text{ Area of the rhombus} = 54 \text{ cm}^2 \end{array}$ 

Question 12.

A man has to build a rhombus shaped swimming pool. One of the diagonal is 13 m and the other is twice the first one. Then find the area of the swimming pool and also find the cost of cementing the floor at the rate of ₹ 15 per sq. cm.

#### Solution:

Let the first diagonal  $d_1 = 13 \text{ m}$   $d_2 = 2 \times 13 \text{ m} = 26 \text{ m}$ Area of the rhombus  $= 1/2 \times d_1 \times d_2$  sq. units  $= 1/2 \times 13 \times 26 \text{ m}^2 = 169 \text{m}^2$ Cost of cementing  $1 \text{ m}^2 = \text{\ensuremath{\ansuremath{\ansuremath{\ensuremath{\ansuremath{\ensuremath{\ensuremath{\ansuremath{\ensuremath{\ensuremath{\ansuremath{\ensuremath{\ensuremath{\ensuremath{\ansuremath{\ansuremath{\ansuremath{\ensuremath{\ansuremath$ 

Question 13. Find the height of the parallelogram whose base is four times the height and whose area is 576 sq. cm.

#### Solution:

Let the height be 'A' and base be 'h' units Given  $b = 4 \times h$ Area of the parallelogram = 576 sq. cm  $b \times h = 576$  $4h \times h = 576$  $h \times h = 576/4 = 144$  $h \times h = 12 \times 12$ h = 12 cm Height = 12 cm; base =  $4 \times 12 = 48$  cm

#### Question 14.

The table top is in the shape of a trapezium with measurements given in the figure. Find the cost of the glass used to cover the table at the rate of  $\gtrless$  6 per 10 sq. cm.



# Solution:

Length of the parallel sides a = 200 cm b = 150 cmHeight h = 50 cmArea of the trapezium  $= 1/2 \times h (a + b)$  sq. units  $= 1/2 \times 50 (200 + 150) \text{ cm}^2$   $= 1/2 \times 50 \times 350 \text{ cm}^2 = 8750 \text{ cm}^2$ Cost for 10 sq. cm glass = ₹ 68  $\therefore$  Cost of 8750 cm<sup>2</sup> glass  $= 875010 \times 6 = ₹ 5250$ Cost of glass used = ₹ 5,250

#### Question 15.

Arivu has a land ABCD with the measurements given in the figure. If a portion ABED is used for cultivation (where E is the midpoint of DC). D Find the cultivated area.



#### Solution:

From the figure given ABED is a trapazium with height h = 18 mOne of the parallel side a = 24 mSince E is the midpoint of D. Other parallel side b = 24/2 = 12 mArea of the cultivated ADEB  $= 1/2 \times h(a + b) \text{ m}^2 = 12 \times 18 (24 + 12)$  $= 9 \times 36 \text{ m}^2 = 324 \text{ m}^2$ Area of cultivation  $= 324 \text{ m}^2$