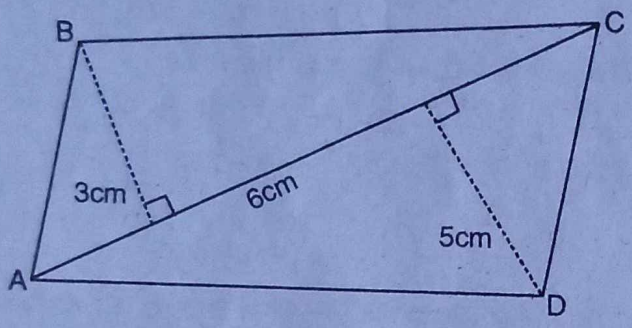
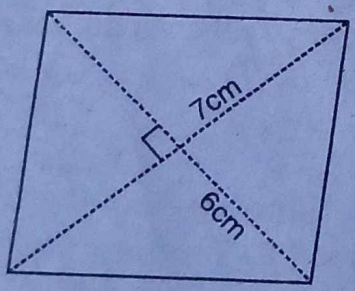
TEXT BOOK EXERCISE 9.2

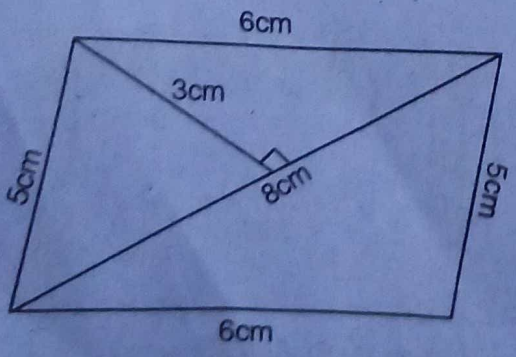
Q. 1. Find the area of the quadrilaterals given below in figure 9.15 (Textbook).



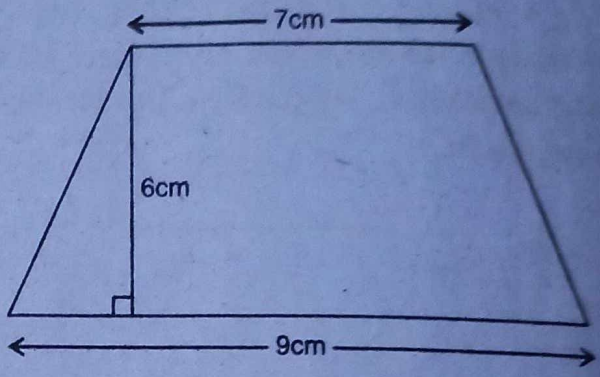
(i)



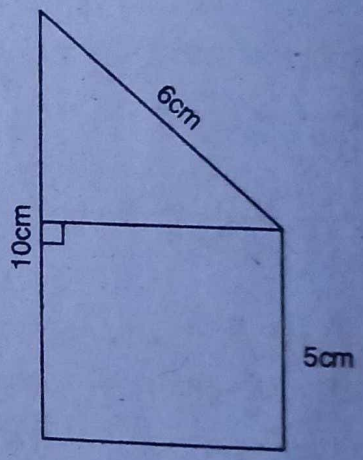
(ii)



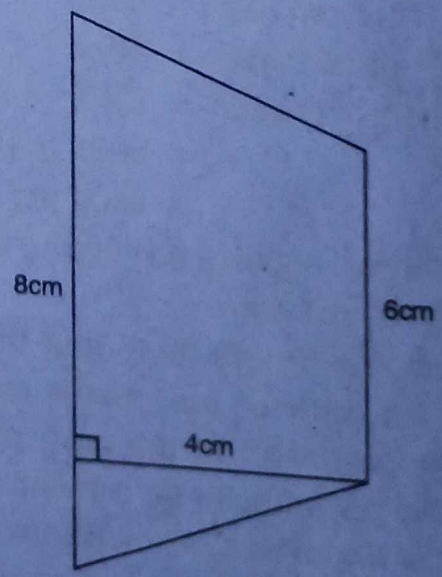
(iii)



(iv)



(v)



(vi)

Solution.

(*i*) Here, d = AC = 6 cm

h_1 = 5 cm and h_2 = 3 cm

Area of quadrilateral ABCD

$$= \frac{1}{2} d (h_1 + h_2)$$

$$= \frac{1}{2} \times 6 \times (5 + 3) \text{ cm}^2$$

$$= \frac{1}{2} \times 6 \times 8 \text{ cm}^2$$

$$= 24 \text{ cm}^2 \textbf{ Ans.}$$

(*ii*) Here, d_1 = 7 cm and d_2 = 6 cm

Area of rhombus $= \frac{1}{2} \times d_1 \times d_2$

$$= \frac{1}{2} \times 7 \times 6 \text{ cm}^2$$

$$= 21 \text{ cm}^2 \textbf{ Ans.}$$

(*iii*) Here, Base = 8 cm

Height = 3 cm

Area of triangle $= \frac{1}{2} \times$ Base × Height

$$= \frac{1}{2} \times 8 \times 3 \text{ cm}^2 = 12 \text{ cm}^2$$

Area of the parallelogram = 2 × Area of triangle

$$= 2 \times 12 \text{ cm}^2 = 24 \text{ cm}^2$$

Ans.

(*iv*) Here, given parallel sides are a = 9 cm, b = 7 cm and h = 6 cm

Area of trapezium $= \frac{1}{2} (a + b) \times h$

$$= \frac{1}{2} (9 + 7) \times 6 = \frac{1}{2} \times 16 \times 6 \text{ cm}^2$$

$$= 48 \text{ cm}^2 \textbf{ Ans.}$$

(*v*) Here, given parallel sides are a = 10 cm, b = 5 cm and h = 5 cm.

Area of trapezium $= \frac{1}{2} (a + b) \times h$

$$= \frac{1}{2} (10 + 5) \times 5 \text{ cm}^2$$

$$= \frac{1}{2} \times 15 \times 5 \text{ cm}^2$$

$$= \frac{75}{2} \text{ cm}^2 = 37.5 \text{ cm}^2.$$

(*vi*) Here, given parallel sides are a = 8 cm, b = 6 cm and h = 4 cm

Area of trapezium $= \frac{1}{2} \times (a + b) \times h$

$$= \frac{1}{2} \times (8 + 6) \times 4 \text{ cm}^2$$

$$= \frac{1}{2} \times 14 \times 4 \text{ cm}^2$$

$$= 28 \text{ cm}^2 \textbf{ Ans.}$$

Q. 2. The area of a rhombus is 320 cm^2. If length of its one diagonal is 16 cm. Find the length of the other diagonal.

Solution. Here, area of rhombus = 320 cm^2

Length of one of its diagonal (d_1) = 16 cm

Let length of the other diagonal = d_2

Area of rhombus $= \frac{1}{2}$ × Product of the diagonals $= \frac{1}{2} d_1 \times d_2$

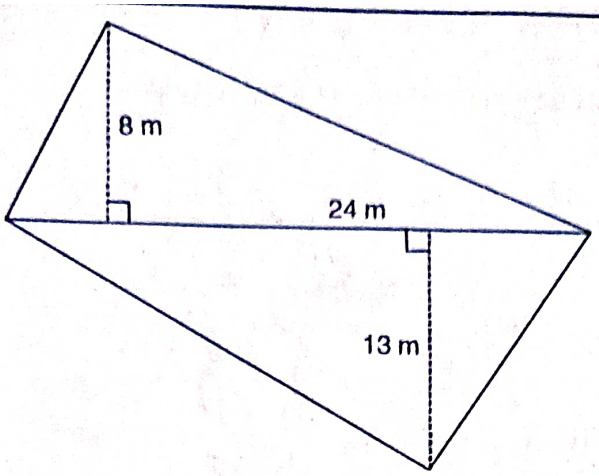
$\therefore \quad 320 = \frac{1}{2} \times 16 \times d_2$

i.e. $\quad 8d_2 = 320$

So, $\quad d_2 = \frac{320}{8} = 40$ cm

Hence, length of other diagonal = 40 cm **Ans.**

Q. 3. One diagonal of a quadrilateral field is 24 m and the altitudes dropped on it from the opposite vertices are 8 m and 13 m. Find the area of the field [fig. 9.16 (Textbook)].



Solution. Here, $h_1 = 13$ m, $h_2 = 8$ m and $d = 24$ m

Area of the quadrilateral $= \frac{1}{2} d (h_1 + h_2)$

$= \frac{1}{2} \times 24 \times (13 + 8)$ m^2

$= 12 \times 21$ m$^2 = 252$ m^2

Hence, area of the field = 252 m^2 **Ans.**

Q. 4. The diagonals of a rhombus are 7.5 cm and 12 cm. Find its area.

Solution. Here, $d_1 = 7.5$ cm, $d_2 = 12$ cm

Area of the rhombus $= \frac{1}{2} \times d_1 \times d_2$

$= \frac{1}{2} \times 7.5 \times 12$ cm^2

$= 45$ cm^2

Hence, area of the rhombus = 45 cm^2 **Ans.**

Q. 5. Find the area of a square whose length of diagonal is 10 cm.

Solution. Here, length of diagonal (d) = 10 cm

Area of square $= \frac{1}{2} \times d^2 = \frac{1}{2} \times (10)^2$ cm^2

$= \frac{1}{2} \times 100$ cm$^2 = 50$ cm^2

Hence, area of square = 50 cm^2 **Ans.**

Q. 6. Find the area of a rhombus with side 8 cm and altitude 4.8 cm.

Solution. Here, side of the rhombus = 8 cm

and altitude = 4.8 cm

Area of rhombus = side × altitude

= 8×4.8 cm^2

= 38.4 cm^2

Hence, area of rhombus = 38.4 cm^2 **Ans.**

Q. 7. Find the area of rhombus whose side is 5 cm and whose altitude is 4.8 cm. If one of its diagonal is 8 cm. Find the length of other diagonal.

Solution. Here, side of rhombus = 5 cm

and altitude = 4.8 cm

Area of rhombus = 5×4.8 cm$^2 = 24$ cm^2

Also, area of rhombus = $\frac{1}{2}$ × Product of the diagonals

$\therefore \quad 24 = \frac{1}{2} \times 8 \times d$

$\Rightarrow \quad 8 \times d = 48$

$\Rightarrow \quad d = \frac{48}{8} = 6$ cm

Hence, the length of the other diagonal = 6 cm **Ans.**

Q. 8. Find the area of a trapezium shaped field if the parallel sides are of length 250 m and 160 m and the distance between them is 100 m.

Solution. Length of parallel sides $a = 250$ m, $b = 160$ m

and Distance between them, $h = 100$ m

Area of trapezium $= \frac{1}{2} \times (a + b) \times h$

$= \frac{1}{2} \times (250 + 160) \times 100$ m^2

$= \frac{1}{2} \times 410 \times 100$ m^2

$= 20500$ m^2 **Ans.**

Q. 9. Find the other parallel side of trapezium if its area is 300 m^2. One parallel side is 15 m and distance between parallel sides is 15 m.

Solution. One parallel side of trapezium = 15 m

Let other parallel side = a m

Distance between parallel sisdes (h) = 15 m

Area of trapezium = 300 m^2

Area of trapezium = $\frac{1}{2}$ × Sum of parallel sides × h

$\Rightarrow \quad 300 = \frac{1}{2} \times (15 + d) \times 15$

$\Rightarrow (15 + d) \times 15 = 600$

$\Rightarrow \quad 15 + d = \frac{600}{15} = 40$

$\therefore \quad d = 40 - 15 = 25$ m

Hence, the length of other parallel side = 25 m **Ans.**

Q. 10. Find the area of a trapezium whose parallel sides are 1 m and 1.2 m and perpendicular distance between them is 0.8 m.

Solution. The parallel sides of the trapezium are a = 1 m, b = 1.2 m and perpendicular distance (d) = 0.8 m

Area of the trapezium = $\frac{1}{2} \times (a+b) \times h$

$= \frac{1}{2}(1+1.2) \times 0.8$ m^2

$= \frac{1}{2} \times 2.2 \times 0.8$ m^2

$= 0.88$ m^2 **Ans.**

Q. 11. The floor of a building consists of 2400 tiles which are rhombus shaped having diagonals 45 cm and 32 cm in length. Find the total cost of polishing the floor, if the cost per m^2 is ₹ 4.

Solution. Here, d_1 = 45 cm, d_2 = 32 cm

$\therefore$ Area of one tile = $\frac{1}{2}$ × Product of diagonals

$= \frac{1}{2} \times d_1 \times d_2$

$= \frac{1}{2} \times 45 \times 32$ cm^2

$= 45 \times 16$ cm^2

$= 720$ cm^2

Area of 2400 tiles = 2400×720 cm^2

$= \frac{2400 \times 720}{100 \times 100}$ m^2

$= 172.8$ m^2

Cost per m^2 = ₹ 4

Total cost of 172.8 m^2 = ₹ 4×172.8

= 691.20

Hence, total cost of polishing the floor = ₹ 691.20 **Ans.**

Q. 12. Multiple Choice Questions :

(*i*) Find the area of a rhombus whose diagonals are 4 cm and 6 cm.

(*a*) 24 cm^2 (*b*) 12 cm^2

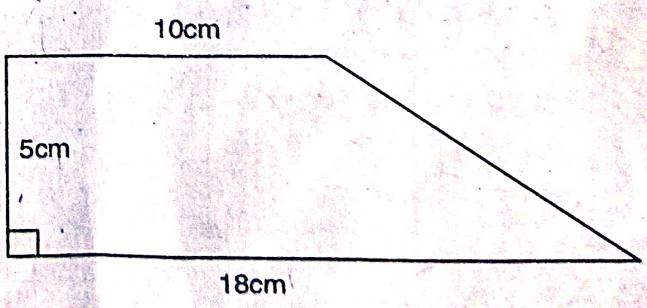
(*c*) 10 cm^2 (*d*) 18 cm^2.

(*ii*) Find the area of a square whose diagonal is d.

(*a*) d^2 (*b*) $\frac{1}{2}d$

(*c*) $2d^2$ (*d*) $\frac{1}{2}d^2$.

(*iii*) Find the area of the given figure.



(*a*) 70 cm^2 (*b*) 180 cm^2

(*c*) 90 cm^2 (*d*) 120 cm^2.

Ans. (*i*) (*b*) 12 cm^2 (*ii*) (*d*) $\frac{1}{2}d^2$

(*iii*) (*a*) 70 cm^2