EXERCISE 9.1

Write the correct answer in each of the following:
1. The median of a triangle divides it into two
(A) triangles of equal area
(B) congruent triangles
(C) right triangles
(D) isosceles triangles
Solution:

(A) triangles of equal area

Explanation:

The median of a triangle divides it into triangle of equal area.
Hence, option (A) is the correct answer.

2. In which of the following figures (Fig. 9.3), you find two polygons on the same base and between the same parallels?

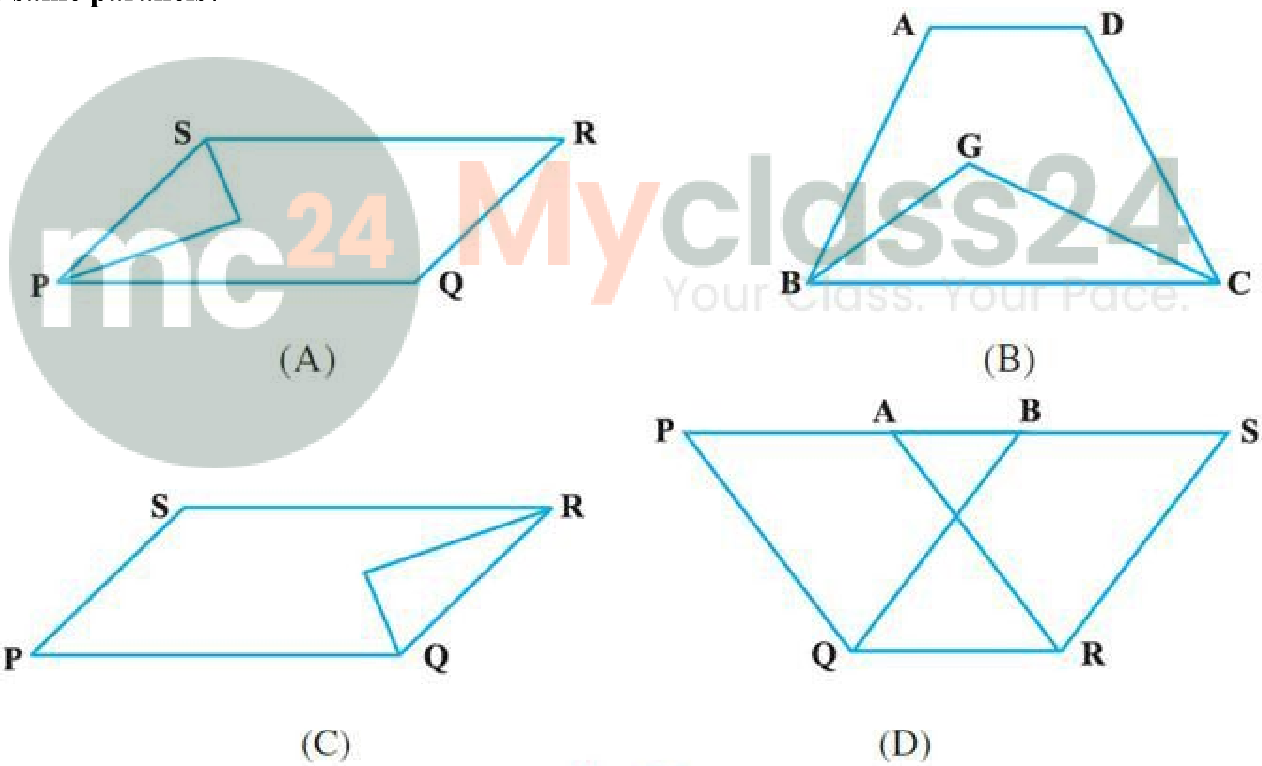


Fig. 9.3

Solution:

(D)

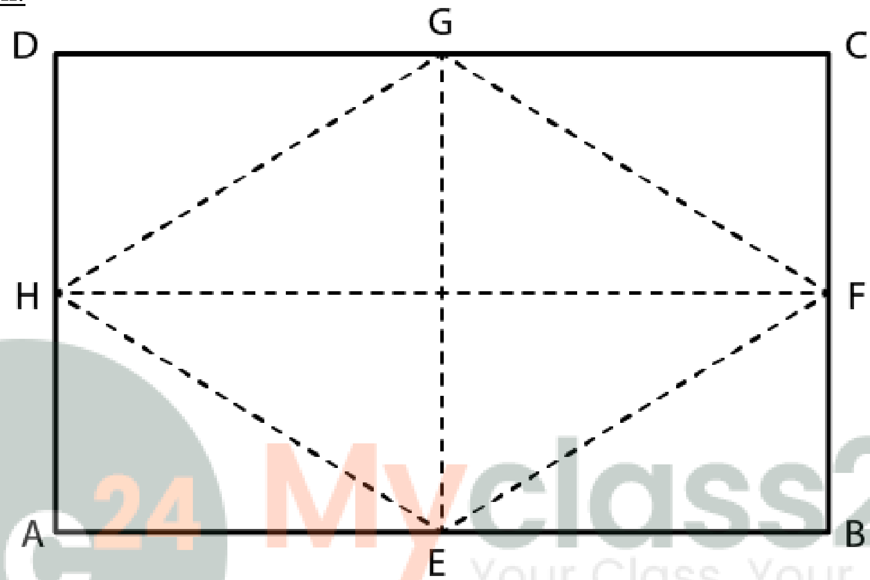
Explanation:

In figure (D), the parallelograms, PQRA and BQRS are on the same base QR and between the same parallels QR and PS.
Hence, option (D) is the correct answer.

3. The figure obtained by joining the mid-points of the adjacent sides of a rectangle of sides 8 cm and 6 cm is :
(A) a rectangle of area 24 cm^2
(B) a square of area 25 cm^2
(C) a trapezium of area 24 cm^2
(D) a rhombus of area 24 cm^2
Solution:

(D) a rhombus of area 24 cm^2

Explanation:



According to the question,
Let ABCD be the rectangle.
E is the mid-point of the side AB
F is the mid-point of the side BC
G is the mid-point of the side CD
H is the mid-point of the side DA
The figure obtained by joining the midpoints E, F, G and H is rhombus.
Sides of the rectangle is given,
We know that,
Side of the rectangle AB = diagonal of the rhombus FH = 8cm
Similarly,
Side of the rectangle AD = diagonal of the rhombus EG = 6cm
Then,

Area of the rhombus $= \frac{1}{2} \times EG \times FH$
$= \frac{1}{2} \times 6 \times 8$
$= 24 \text{ cm}^2$

Hence, option (D) is the correct answer.

4. In Fig. 9.4, the area of parallelogram ABCD is:
(A) AB × BM

(B) BC × BN
(C) DC × DL
(D) AD × DL

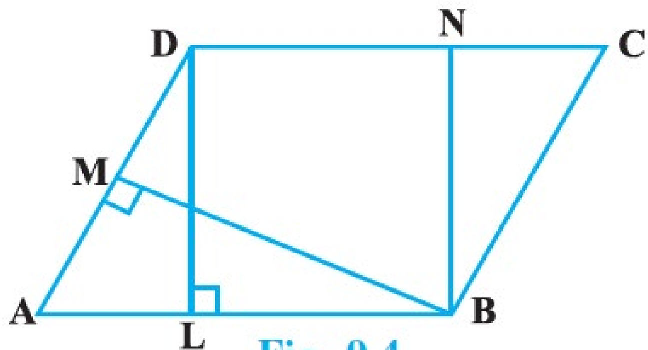


Fig. 9.4

Solution:

(C) DC × DL

Explanation:

Area of parallelogram = Base × Corresponding altitude
= AB × DL … (eq 1)

Since, opposite sides of a parallelogram are equal,
We get,
AB = DC

Substituting this in eq(1), we get,
Area of parallelogram = AB × DL
= DC × DL

Hence, option (C) is the correct answer.

5. In Fig. 9.5, if parallelogram ABCD and rectangle ABEF are of equal area, then :
(A) Perimeter of ABCD = Perimeter of ABEM
(B) Perimeter of ABCD < Perimeter of ABEM
(C) Perimeter of ABCD > Perimeter of ABEM
(D) Perimeter of ABCD = ½ (Perimeter of ABEM)

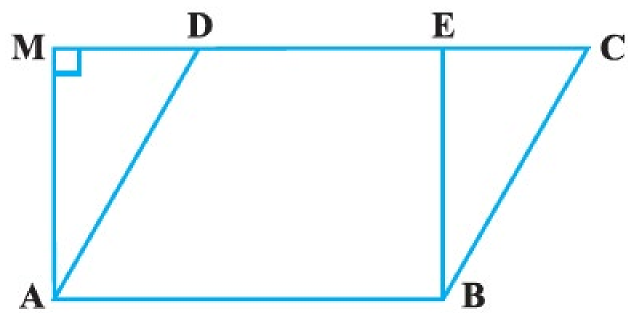


Fig. 9.5

Solution:

(C) Perimeter of ABCD > Perimeter of ABEM

Explanation:

In rectangle ABEM,
AB = EM …(eq.1) [sides of rectangle]
In parallelogram ABCD,
CD = AB …(eq.2)
Adding, equations (1) and (2),
We get
AB + CD = EM + AB …(i)
We know that,
Perpendicular distance between two parallel sides of a parallelogram is always less than the length of the other parallel sides.
BE < BC and AM < AD
[because, in a right angled triangle, the hypotenuse is greater than the other side]
On adding both above inequalities, we get
SE + AM <BC + AD or BC + AD> BE + AM
On adding AB + CD both sides, we get
AB + CD + BC + AD> AB + CD + BE + AM
⇒ AB+BC + CD + AD> AB+BE + EM+ AM [∴ CD = AB = EM]
Hence,
We get,
Perimeter of parallelogram ABCD > perimeter of rectangle ABEM
Hence, option (C) is the correct answer.