

Exercise VSAQs

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Question 1: If ABC and BDE are two equilateral triangles such that D is the mid-point of BC, then find $\text{ar}(\triangle ABC) : \text{ar}(\triangle BDE)$.

Solution:

Given: ABC and BDE are two equilateral triangles.

We know, area of an equilateral triangle = $\frac{\sqrt{3}}{4} (\text{side})^2$

Let "a" be the side measure of given triangle.

Find $\text{ar}(\triangle ABC)$:

$$\text{ar}(\triangle ABC) = \frac{\sqrt{3}}{4} (a)^2$$

Find $\text{ar}(\triangle BDE)$:

$$\text{ar}(\triangle BDE) = \frac{\sqrt{3}}{4} (a/2)^2$$

(D is the mid-point of BC)

Now,

$$\text{ar}(\triangle ABC) : \text{ar}(\triangle BDE)$$

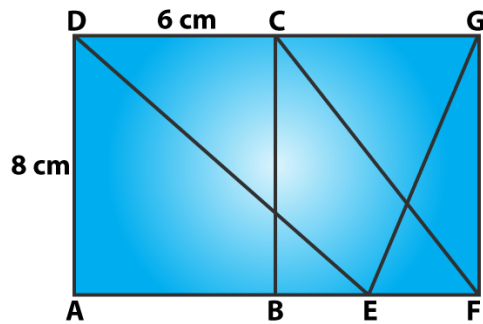
$$\text{or } \frac{\sqrt{3}}{4} (a)^2 : \frac{\sqrt{3}}{4} (a/2)^2$$

$$\text{or } 1 : 1/4$$

$$\text{or } 4:1$$

This implies, $\text{ar}(\triangle ABC) : \text{ar}(\triangle BDE) = 4:1$

Question 2: In figure, ABCD is a rectangle in which CD = 6 cm, AD = 8 cm. Find the area of parallelogram CDEF.



Solution:

ABCD is a rectangle, where $CD = 6\text{ cm}$ and $AD = 8\text{ cm}$ (Given)

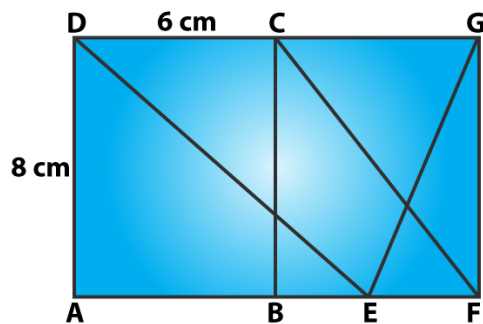
From figure: Parallelogram CDEF and rectangle ABCD on the same base and between the same parallels, which means both have equal areas.

Area of parallelogram CDEF = Area of rectangle ABCD(1)

Area of rectangle ABCD = $CD \times AD = 6 \times 8\text{ cm}^2 = 48\text{ cm}^2$

Equation (1) \Rightarrow Area of parallelogram CDEF = 48 cm^2 .

Question 3: In figure, find the area of ΔGEF .



Solution:

From figure:

Parallelogram CDEF and rectangle ABCD on the same base and between the same parallels, which means both have equal areas.

Area of CDEF = Area of ABCD = $8 \times 6\text{ cm}^2 = 48\text{ cm}^2$

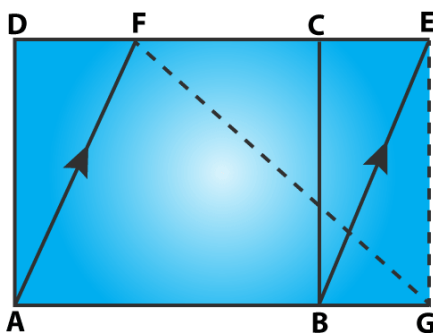
Again,

Parallelogram CDEF and triangle EFG are on the same base and between the same parallels, then
Area of a triangle = $\frac{1}{2}$ (Area of parallelogram)

In this case,

Area of a triangle EFG = $\frac{1}{2}$ (Area of parallelogram CDEF) = $\frac{1}{2}(48 \text{ cm}^2) = 24 \text{ cm}^2$.

Question 4: In figure, ABCD is a rectangle with sides AB = 10 cm and AD = 5 cm. Find the area of ΔEFG .



Solution:

From figure:

Parallelogram ABEF and rectangle ABCD on the same base and between the same parallels, which means both have equal areas.

Area of ABEF = Area of ABCD = $10 \times 5 \text{ cm}^2 = 50 \text{ cm}^2$

Again,

Parallelogram ABEF and triangle EFG are on the same base and between the same parallels, then
Area of a triangle = $\frac{1}{2}$ (Area of parallelogram)

In this case,

Area of a triangle EFG = $\frac{1}{2}$ (Area of parallelogram ABEF) = $\frac{1}{2}(50 \text{ cm}^2) = 25 \text{ cm}^2$.

Question 5: PQRS is a rectangle inscribed in a quadrant of a circle of radius 13 cm. A is any point on PQ. If PS = 5 cm, then find ar(ΔRAS).

Solution:

PQRS is a rectangle with PS = 5 cm and PR = 13 cm (Given)

In $\triangle PSR$:

Using Pythagoras theorem,

$$SR^2 = PR^2 - PS^2 = (13)^2 - (5)^2 = 169 - 25 = 144$$

or $SR = 12$

Now,

Area of $\triangle RAS = \frac{1}{2} \times SR \times PS$

$$= \frac{1}{2} \times 12 \times 5$$

$$= 30$$

Therefore, Area of $\triangle RAS$ is 30 cm^2 .

