AREA FORMULAS

A AREA OF A RECTANGLE OR A SQUARE

Discover: To find the area of the rectangle:



1. Count the number of squares in each column:



2. Add them up: the area is $3 + 3 + 3 + 3 + 3 = 5 \times 3$. This shows that the area of the rectangle is found by multiplying the length by the width.



Method Finding a Shape's Area

To find the area of a rectangle or a square, multiply its length by its width.

Ex: Find the area of the rectangle:



Answer: This is a rectangle with length L = 8 m and width l = 4 m. Using the formula for the area of a rectangle:

$$A = L \times l$$
$$= 8 \times 4$$
$$= 32 \,\mathrm{m}^2$$

So, the area is 32 square meters.

B AREA OF A TRIANGLE

Discover: To find the area of a triangle, we can cut it along its height to form two smaller triangles, then rearrange them to make a rectangle. Let's see how this works step by step with the triangle below:



1. Cut the triangle along the height to form two smaller triangles. Rotate and rearrange these triangles to form a rectangle:



2. The area of the rectangle is the length multiplied by the width: 4×3 . Since the area of the rectangle is equal to twice that of the original triangle, the area of the triangle is the area of the rectangle divided by two: $\frac{4 \times 3}{2} = \frac{\text{base} \times \text{height}}{2}$.

Proposition Area of a Triangle
The area of a triangle is found by multiplying the base by the height and dividing by 2:
Area of a triangle =
$$\frac{base \times height}{2}$$

 $A = \frac{b \times h}{2}$
 b

Ex: Find the area of the triangle:



Answer:

 $=4\,\mathrm{cm}^2$

 $A = \frac{b \times h}{2}$ $= \frac{4 \times 2}{2}$

C AREA OF A PARALLELOGRAM

Discover: To find the area of a parallelogram, we can turn it into a rectangle by moving a triangle from one side to the other. Let's see how this works step by step with the parallelogram below:



1. Draw the height, which is a line from the top side to the bottom side that is perpendicular to the base:



2. Cut the triangle on the right side:



3. Move the triangle to the left side to form a rectangle:



4. Now we have a rectangle with a length (base) of 4 cm and a height of 3 cm. The area of the parallelogram is the same as the area of this rectangle, which is the base times the height: $4 \times 3 = 12 \text{ cm}^2$.



Ex: Find the area of the parallelogram:



Answer:

D AREA OF A CIRCLE

Discover: To find the area of a circle, we can divide it into smaller parts and rearrange them to approximate a parallelogram. Let's see how this works step by step:

 $= 8 \,\mathrm{cm}^2$

1. Divide the circle into 12 equal parts, like slices of a pie:



- 2. Imagine cutting these 12 parts from the circle.
- 3. Rearrange the parts by alternating them to form a shape that looks like a parallelogram:



4. The base of the parallelogram is approximately half the circumference of the circle (πr) , and its height is approximately the radius (r). So, the area of the circle is the area of the parallelogram:

 $A_{\text{circle}} = (\pi r) \times r$ $= \pi \times r \times r$

Proposition Area of a Circle

The area of a circle is found by multiplying pi by the radius squared:

Area of a circle = $\pi \times \text{radius} \times \text{radius}$

 $A = \pi r \times r$



 $\ensuremath{\mathbf{Ex:}}\xspace$ Find the area of the circle:



Answer:

 $\begin{aligned} A &= \pi \times r \times r \\ &= \pi \times 3 \times 3 \\ &\approx 28.3 \, \mathrm{cm}^2 \end{aligned}$

E AREA FORMULAS



F AREA OF COMPOSITE FIGURES

Definition Composite Figure _

A **composite figure** is made up of two or more simple geometric shapes, like rectangles, triangles, or circles, combined together.

Method Finding the Area of a Composite Figure

To find the area of a composite figure, follow these steps:

- 1. Divide the figure into simple, non-overlapping shapes, such as rectangles, triangles, or circles.
- 2. Find the area of each simpler shape using the appropriate formula.
- 3. Add the areas together to find the total area of the composite figure.

Ex: Find the area of the composite figure below, which is made up of a square and a triangle:

(°±°)



Answer:

A = Area of square + Area of triangle $= s \times s + \frac{b \times h}{2}$

$$= 3 \times 3 + \frac{3 \times 2}{2}$$
$$= 9 + 3$$
$$= 12 \text{ cm}^2$$