LENGTH

A LENGTH UNITS

Definition Units of Length _

• Millimeter (mm): A very small unit of length, about the thickness of a coin.



• Centimeter (cm): A small unit of length, about the width of your finger.



• Meter (m): A longer unit of length, about the height of a 6-year-old girl.



• Kilometer (km): A very long unit of length, about the height of the Burj Khalifa in Dubai, United Arab Emirates.



B CONVERSION OF LENGTH UNITS

Definition Conversion of Length Units _

- 1 km = 1000 m
- 1 m = 100 cm
- 1 cm = 10 mm

Method Converting using a Multiplication or a Division .

- Use multiplication to go from a bigger unit to a smaller one (like meters to centimeters).
- Use division to go from a smaller unit to a bigger one (like centimeters to meters).



Method Converting Using a Table _

To convert between units of length, we can use a conversion table. For example, to convert 1.2 meters to centimeters:

1. Write the units in the table: km, m, cm, mm.

km		m	cm	$\mathbf{m}\mathbf{m}$

2. Place the number in the column of the unit you start with.

km		m		cm	mm
		1.	2		

3. Fill in zeros in the columns to the right until you reach the unit you want to convert to.

km		m		cm	mm
		1.	2	0	

4. Read the number in the column of the target unit

So, 1.2 m = 120 cm.

C PERIMETER

- Definition **Perimeter**

The **perimeter** of a shape is the total length around its outside edge.

To find the perimeter, imagine walking around the shape like it's a park. Count the number of unit lengths along each side as you go.

Ex: Find the perimeter of the red shape:





To find the perimeter, we add the length of all 4 sides : 2 + 2 + 2 + 2. The perimeter is 8 units.

D PERIMETER OF COMMON SHAPES

Method Finding a Polygon's Perimeter

To find the perimeter of any polygon (a shape with straight sides), add up the lengths of all its sides.







Answer: This is a rectangle with length l = 14 m and width w = 7 m. Using the formula for the perimeter of a rectangle:

$$P = (2 \times l) + (2 \times w)$$

= (2 × 14) + (2 × 7)
= 28 + 14
= 42 m

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E LENGTH OF AN ARC

Definition Arc of a Circle

An **arc** is a part of the circumference of a circle. The length of an arc depends on the angle it makes at the center of the circle.

Ex: A quarter circle (90 degrees) has an arc that is one-fourth of the full circumference.



Method Finding the Length of an Arc

To find the length of an arc of a circle:

- 1. Determine the fraction of the circle that the arc represents by dividing the arc's central angle by 360 degrees: Fraction = $\frac{\text{central angle}}{360}$.
- 2. Multiply the full circumference by the fraction to find the arc length: Arc length = Fraction \times Circumference.

Ex: Find the length of the arc of circle



Answer:

• Determine the fraction of the circle that the arc represents:

Fraction =
$$\frac{\text{central angle}}{360}$$

= $\frac{90}{360}$
= $\frac{1}{4}$

• Multiply the full circumference by the fraction to find the arc length:

Arc length = Fraction \times Circumference

$$= \frac{1}{4} \times 2 \times \pi \times 4$$

\$\approx 6.3 cm (use calculator)

F PERIMETER OF COMPOSITE FIGURES

Definition Composite Figure -

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

Method Finding the Perimeter of a Composite Figure

To find the perimeter of a composite figure:

- 1. Identify all the outer sides of the shape.
- 2. Add the lengths of these outer sides together to find the total perimeter.

Ex: Find the perimeter of the composite figure:

