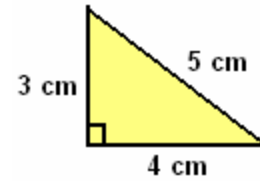


## MATC9 Get Ready for Grade 9 Area and Perimeter Worked Examples and Practice

**Example 1:** Find the area and perimeter of the triangle shown.



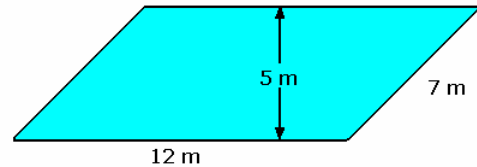
**Solution:** The area of a triangle is given by  $A = \frac{1}{2}bh$ . The base of the given triangle is 4 cm, and the height is 3 cm.

$$\begin{aligned} A &= \frac{1}{2}bh \\ &= \frac{1}{2} \times 4 \times 3 \\ &= 6 \text{ cm}^2 \end{aligned}$$

The perimeter of a triangle is calculated by adding the lengths of the three sides.

$$\begin{aligned} P &= a + b + c \\ &= 3 + 4 + 5 \\ &= 12 \text{ cm} \end{aligned}$$

**Example 2:** Find the area and perimeter of the parallelogram shown.



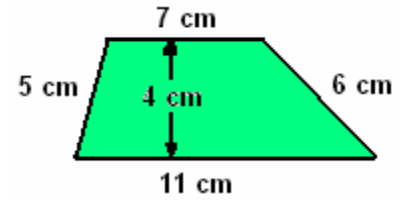
**Solution:** The area of a parallelogram is given by  $A = bh$ . The base of the given parallelogram is 12 m, and the height is 5 m.

$$\begin{aligned} A &= bh \\ &= 12 \times 5 \\ &= 60 \text{ m}^2 \end{aligned}$$

The perimeter of a parallelogram is calculated by adding the lengths of the four sides.

$$\begin{aligned} P &= a + b + c + d \\ &= 7 + 12 + 7 + 12 \\ &= 38 \text{ m} \end{aligned}$$

**Example 3:** Find the area and perimeter of the trapezoid shown.



**Solution:** The area of a trapezoid is given by

$A = \frac{1}{2}h(a + b)$ . In the trapezoid shown,  $a = 11$ ,  $b = 7$ , and  $h = 4$ .

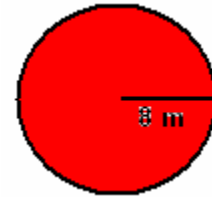
$$\begin{aligned} A &= \frac{1}{2}h(a + b) \\ &= \frac{1}{2} \times 4 \times (11 + 7) \\ &= 36 \text{ cm}^2 \end{aligned}$$

The perimeter of a trapezoid is calculated by adding the lengths of the four sides.

$$\begin{aligned} P &= a + b + c + d \\ &= 5 + 7 + 6 + 11 \\ &= 29 \text{ cm} \end{aligned}$$

**Example 4:** Find the area and perimeter of the circle shown.

**Solution:** The area of a circle is given by  $A = \pi r^2$ . The radius of the circle shown is 8 m.



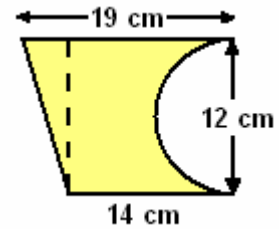
$$\begin{aligned} A &= \pi r^2 \\ &= \pi(8)^2 \\ &= 201.1 \text{ m}^2 \end{aligned}$$

The perimeter, or circumference, of a circle is given by  $C = 2\pi r$ .

$$\begin{aligned} C &= 2\pi r \\ &= 2\pi(8) \\ &= 50.3 \text{ m} \end{aligned}$$

**Example 5:** Find the area and perimeter of the composite shape shown.

**Solution:** The area of the figure can be calculated by finding the area of the trapezoid and subtracting the area of the semicircle.



Area of trapezoid:

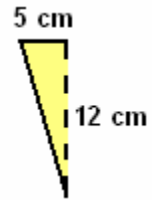
$$\begin{aligned} A &= \frac{1}{2}h(a + b) \\ &= \frac{1}{2} \times 12 \times (14 + 19) \\ &= 198 \text{ cm}^2 \end{aligned}$$

Area of semicircle:

$$\begin{aligned} A &= \frac{1}{2}\pi r^2 \\ &= \frac{1}{2} \times \pi \times 6^2 \\ &= 57 \text{ cm}^2 \end{aligned}$$

The area of the figure is  $198 - 57 = 141 \text{ cm}^2$ .

The perimeter of the figure can be calculated by adding the three sides of the trapezoid to the perimeter of the semicircle. The unknown side of the trapezoid can be determined using the Pythagorean theorem.



$$\begin{aligned} c^2 &= 5^2 + 12^2 \\ &= 169 \\ c &= 13 \text{ cm} \end{aligned}$$

The perimeter of the semicircle can be calculated:

$$\begin{aligned} P &= \frac{1}{2}(2\pi r) \\ &= \pi \times 6 \\ &= 19 \text{ cm} \end{aligned}$$

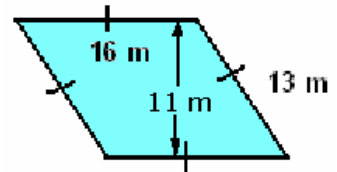
The perimeter of the figure is  $14 + 13 + 19 + 19 = 65 \text{ cm}$ .

**Practice:**

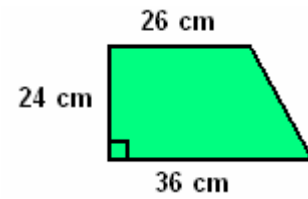
1. Find the area and perimeter of the triangle shown.



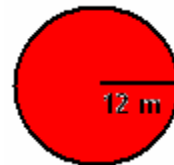
2. Find the area and perimeter of the parallelogram shown.



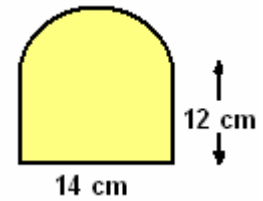
3. Find the area and perimeter of the trapezoid shown.



4. Find the area and perimeter of the circle shown.



5. Find the area and perimeter of the figure shown.



Answers: 1.  $24 \text{ cm}^2$ , 24 cm 2.  $208 \text{ m}^2$ , 58 m 3.  $744 \text{ cm}^2$ , 112 cm 4.  $452 \text{ m}^2$ , 75 m  
5.  $245 \text{ cm}^2$ , 60 cm