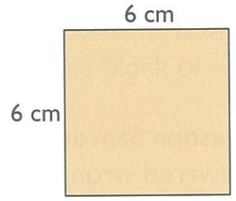
10 Area And Perimeter

Let's Learn!

Area And Perimeter Of Composite Figures

Let us revise area and perimeter of the following figures: square, rectangle, triangle and circle.

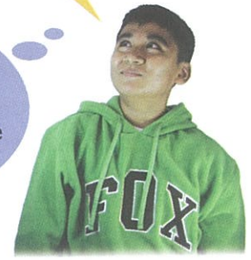
1 A side of the square is 6 cm.



Perimeter of closed figure with straight sides = Sum of its sides

Area of square = Length × Breadth

A square has the same length and breadth.



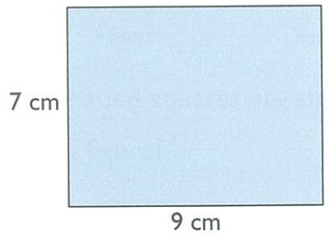
Perimeter = ☐ × ☐

= ☐ cm

Area = ☐ × ☐

= ☐ cm^2

2 The rectangle has length 9 cm and breadth 7 cm.



Area of rectangle = Length × Breadth

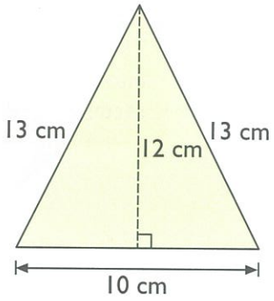
Perimeter = ☐ + ☐ + ☐ + ☐

= ☐ cm

Area = ☐ × ☐

= ☐ cm^2

3 The triangle has sides 13 cm, 13 cm, 10 cm and a height of 12 cm.



Area of triangle = $\frac{1}{2}$ × Base × Height

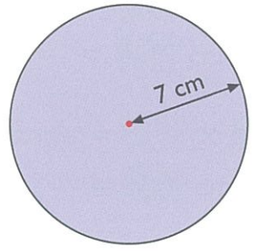
Perimeter = ☐ + ☐ + ☐

= ☐ cm

Area = ☐ × ☐ × ☐

= ☐ cm^2

4 The circle has a radius of 7 cm. $\left(\text{Take } \pi = \frac{22}{7}\right)$



Circumference of circle = π × Diameter

Area of circle = π × Radius × Radius

Circumference = π × ☐

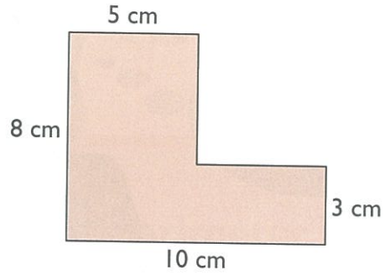
= ☐ cm

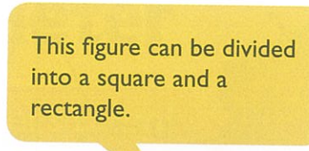
Area = π × ☐ × ☐

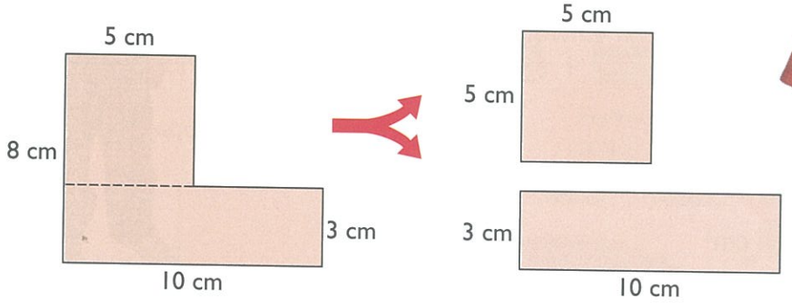
= ☐ cm^2

WB 6B, p 85
Practice 1

5 Find the area and perimeter of the figure.







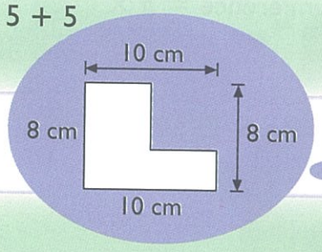
Side of square = 5 cm
Area of square = 5 × 5
= 25 cm²

Area of rectangle = 10 × 3
= 30 cm²

Area of figure = 25 + 30
= 55 cm²

Method 1

Perimeter of figure = 8 + 10 + 3 + 5 + 5 + 5
= 36 cm

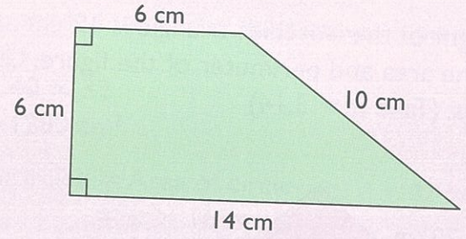


Method 2

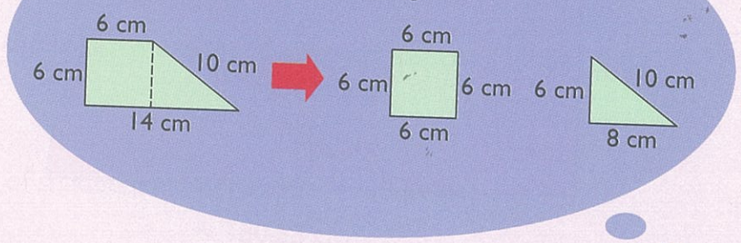
Perimeter of figure = 8 + 10 + 8 + 10
= 36 cm

Home Maths: Get your child to work out the area of your floor tiles, using a measuring tape.

6 Find the area and perimeter of the trapezium.



Divide the trapezium into a square and a triangle.



Area of square = ☐ × ☐
= ☐ cm²

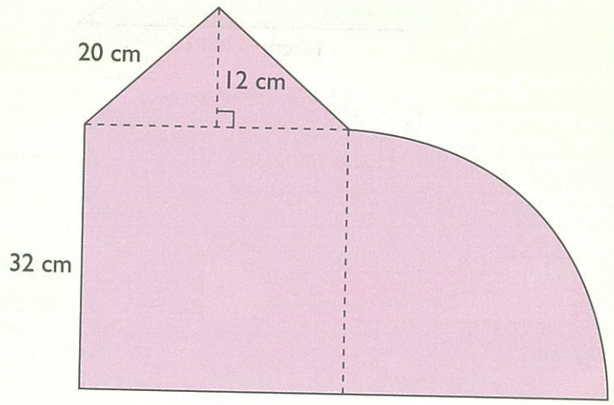
Area of triangle = ☐ × ☐ × ☐
= ☐ cm²

Area of trapezium = ☐ + ☐
= ☐ cm²

Perimeter of trapezium = ☐ + ☐ + ☐ + ☐
= ☐ cm

WB 6B, p 87 Practice 2

7 The figure is made up of a square of side 32 cm, an isosceles triangle and a quadrant. The height of the isosceles triangle is 12 cm and each equal side is 20 cm long. Find the area and perimeter of the figure. Give your answer correct to 2 decimal places. (Take $\pi = 3.14$)



Area of isosceles triangle $= \frac{1}{2} \times 12 \times 32$
$= 192 \text{ cm}^2$

Area of square $= 32 \times 32$
$= 1024 \text{ cm}^2$

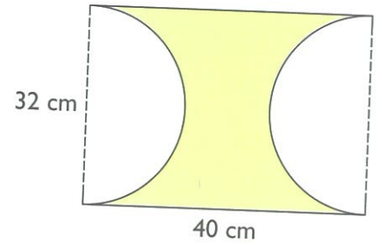
Area of quadrant $= \frac{1}{4} \times 3.14 \times 32 \times 32$
$= 803.84 \text{ cm}^2$

Area of figure $= 192 + 1024 + 803.84$
$= 2019.84 \text{ cm}^2$

Length of quadrant $= \frac{1}{4} \times 3.14 \times 2 \times 32$
$= 50.24 \text{ cm}$

Perimeter of shaded part $= 20 + 20 + 32 + 32 + 32 + 50.24$
$= 186.24 \text{ cm}$

8 The figure shows two semicircles in a rectangle 40 cm by 32 cm. Find the area and perimeter of the shaded part. Give your answer correct to 2 decimal places.



Area of rectangle $= 40 \times 32$
$= 1280 \text{ cm}^2$

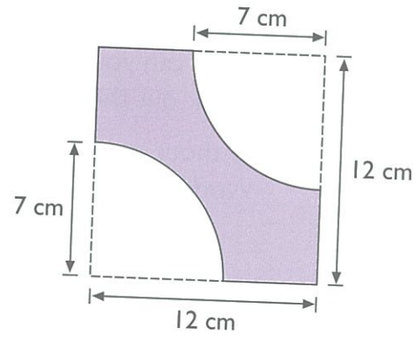
Area of the two semicircles = Area of circle
$= \pi \times 16 \times 16$
$\approx 804.248 \text{ cm}^2$

Area of shaded part $= 1280 - 804.248$
$\approx 475.75 \text{ cm}^2$

Length of the two semicircles = Circumference of circle
$= \pi \times 32$
$\approx 100.531 \text{ cm}$

Perimeter of shaded part $= 100.531 + 40 + 40$
$\approx 180.53 \text{ cm}$

9 The figure shows two quadrants in a square of side 12 cm. Find the area and perimeter of the shaded part. $\left(\text{Take } \pi = \frac{22}{7}\right)$



Area of square $=$ ____ $\times$ ____ $=$ ____ cm^2

Area of the two quadrants
= Area of semicircle
$=$ ____ $\times$ ____ $\times$ ____ $\times$ ____
$=$ ____ cm^2

Area of shaded part $=$ ____ $-$ ____
$=$ ____ cm^2

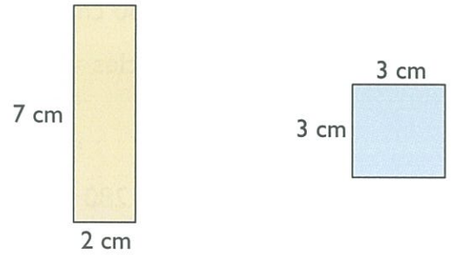
Length of the two quadrants = Length of semicircle
$=$ ____ $\times$ ____ $\times$ ____
$=$ ____ cm

Perimeter of shaded part $=$ ____ $+$ ____ $+$ ____ $+$ ____ $+$ ____
$=$ ____ cm

Let's Explore!

Work in pairs:

1 Draw the rectangle and square on a piece of paper and cut them out.



2 With the rectangle and the square, form these three types of composite figures.

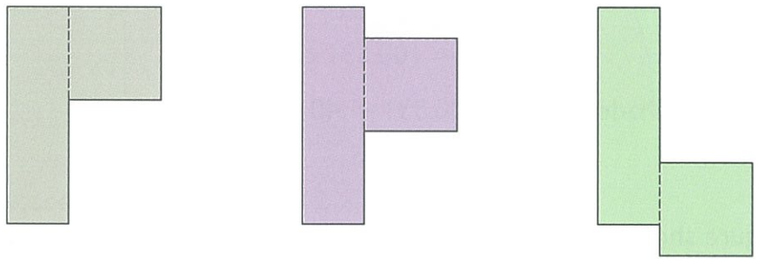


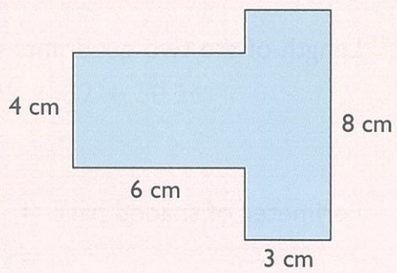
Figure 1 Figure 2 Figure 3

a What can you say about the areas of these composite figures? Work out the area of each figure.

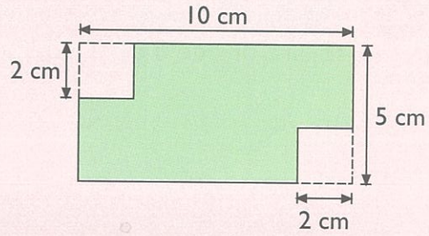
b Without measuring, can you find the perimeter of each figure? Work out the perimeter where possible.

Let's Practise! 10a

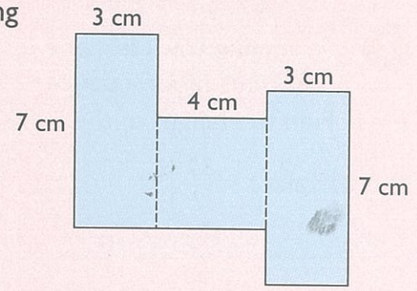
1 Find the area and perimeter of the figure.



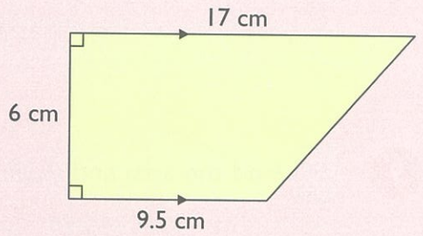
2 Two squares of side 2 cm are cut out of a rectangle 10 cm by 5 cm. Find the area and perimeter of the remaining figure.



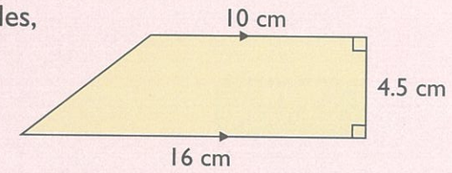
3 The figure is made up of two rectangles measuring 7 cm by 3 cm each and a square of side 4 cm. Find the area and perimeter of the figure.



4 **a** Divide the trapezium into a rectangle and a triangle and find their areas. Hence, find the area of the trapezium.



b By dividing the trapezium into two triangles, find its area.



5 **a** Divide the figure into two right-angled triangles and find their areas. Hence, find the area of the figure.

b Find the perimeter of the figure.