

Solution

(a)

Circumference of 2 semicircles (1 circle)

$$\begin{aligned} &\rightarrow 2\pi r \\ &= 2\pi \times 7.5\text{cm} \\ &= 47.12\text{ cm} \end{aligned}$$

Circumference of 2 quarter circles (1 semi circle)

$$\begin{aligned} &\rightarrow \left(\frac{1}{2}\right)2\pi r \\ &= \left(\frac{1}{2}\right)(2)(\pi) \times 15\text{cm} \\ &= 47.12\text{ cm} \end{aligned}$$

Length of vertical line on the left side of figure

$$\rightarrow 2 \times 15\text{cm} = 30\text{cm}$$

Perimeter of shaded figure

$$\begin{aligned} &\rightarrow 47.12\text{cm} + 47.12\text{cm} + 30\text{cm} \\ &= 124.25\text{cm} \end{aligned}$$

Answer: 124.25 cm

(b)

Area of 2 quarter circles (1 semi circle)

$$\begin{aligned} &\rightarrow \left(\frac{1}{2}\right)\pi r^2 \\ &= \left(\frac{1}{2}\right)\pi \times 15\text{cm} \times 15\text{cm} \\ &= 353.43\text{cm}^2 \end{aligned}$$

Area of 2 semi circles (1 circle)

$$\begin{aligned} &\rightarrow \pi r^2 \\ &= \pi \times 7.5\text{cm} \times 7.5\text{cm} \\ &= 176.71\text{cm}^2 \end{aligned}$$

Area of whole figure

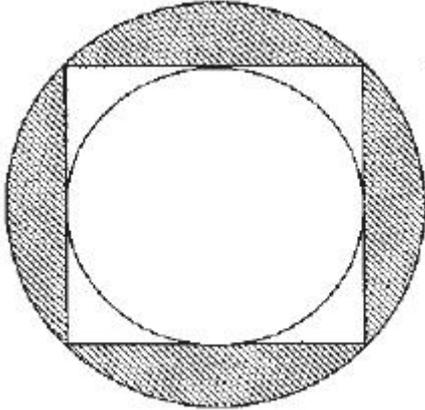
$$\begin{aligned} &\rightarrow 30\text{cm} \times 30\text{cm} \\ &= 900\text{cm}^2 \end{aligned}$$

Shaded area

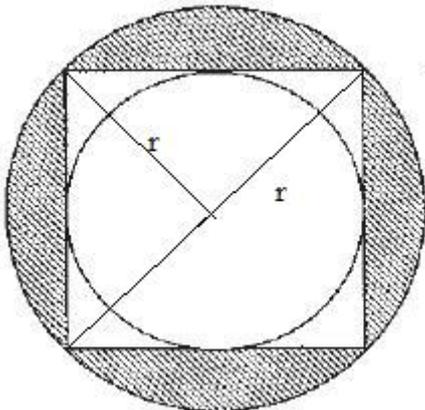
$$\begin{aligned} &\rightarrow 900\text{cm}^2 - 353.43\text{cm}^2 - 176.71\text{cm}^2 \\ &= 369.86\text{cm}^2 \end{aligned}$$

Answer: 369.86cm²

The figure below is made up of a big circle, square and a small circle. The area of the square is 400 square cm. Find the area of the shaded region. (Correct your answer to 2 decimal places)



Solution



Area of square \rightarrow 400 square cm
Length of square \rightarrow 20 cm (square root of 400 sq cm)

Area of 1/4 square
 \rightarrow 400 square cm divided by 4
 $=$ 100 square cm

Area of one right-angle triangle \rightarrow $(1/2)(b)(h)$
100 square cm $= (1/2)(r)(r)$
 $(r)(r) = (100 \text{ square cm}) \times 2 = 200 \text{ square cm}$

Area of circle $= (3.14)(r)(r)$
 $= (3.14)(200 \text{ square cm})$
 $= 628 \text{ square cm}$

Shaded area \rightarrow $(628 - 400) \text{ square cm}$
 $= 228 \text{ square cm}$
 $= 228.00 \text{ square cm}$ (correct to 2 decimal places)

Answer: 228.00 square cm

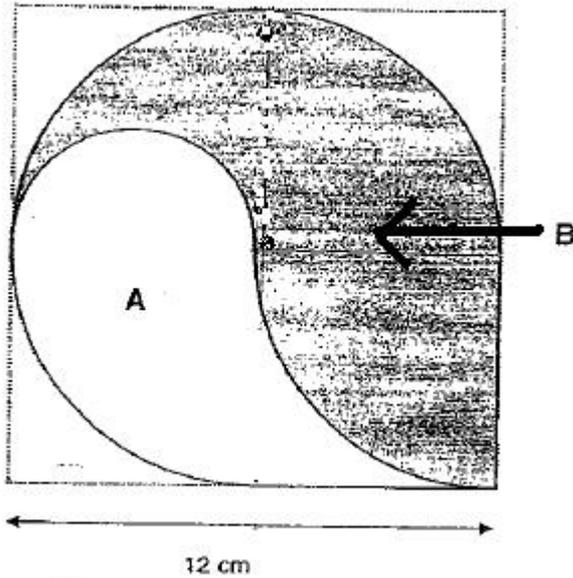
The figure below is made up of semicircles and quadrants. Find

a) the area of A

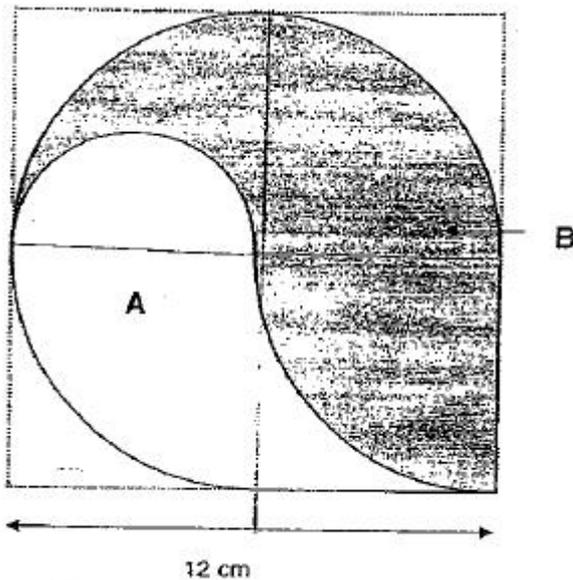
b) the perimeter of B

Leave your answer correct to 1 decimal place.

(Take $\pi = 3.14$)



Solution



a)

Area of unshaded semicircle (on the left of the figure above)

$$\rightarrow \frac{1}{2}(3.14)(3)(3) \text{ sq cm} = 14.13 \text{ sq cm}$$

Area of unshaded square (at the bottom left of the figure)

--> $6\text{ cm} \times 6\text{ cm} = 36\text{ sq cm}$

(The unshaded portion outside the shaded area B on the bottom right square, can be shifted left to form a square at the bottom left of the figure.)

Total Area of A

--> $(14.13 + 36)\text{ sq cm}$

$= 50.13\text{ sq cm}$

$\sim 50.1\text{ sq cm}$

Answer: 50.1 sq cm

b)

Perimeter of B

--> There are 3 quadrants of radius 6cm, 1 semicircle of radius 3 cm and one straight line measuring 6 cm

--> $(\frac{3}{4})(2)(3.14)(6)\text{cm} + (\frac{1}{2})(2)(3.14)(3)\text{cm} + 6\text{ cm}$

$= (28.26 + 9.42 + 6)\text{ cm}$

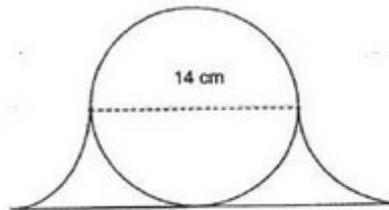
$= 43.68\text{ cm}$

$\sim 43.7\text{ cm}$

Answer: 43.7 cm

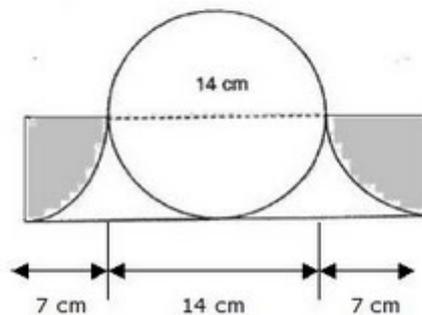
Find the area of the figure.

(Take $\pi = \frac{22}{7}$)



Solution

Redrawing the figure



Area of figure is equal to:

Area of semicircle + Area of rectangle - Area of 2 shaded quadrants

$$\begin{aligned} \text{Area of semicircle} &\rightarrow \pi r^2 \times \frac{1}{2} \\ &= \frac{22}{7} \times 7 \text{ cm} \times 7 \text{ cm} \times \frac{1}{2} = 77 \text{ cm}^2 \end{aligned}$$

$$\text{Area of rectangle} \rightarrow 28 \text{ cm} \times 7 \text{ cm} = 196 \text{ cm}^2$$

$$\begin{aligned} \text{Area of 2 shaded quadrants} &\rightarrow 2 \times \pi r^2 \times \frac{1}{4} \\ &= 2 \times \frac{22}{7} \times 7 \text{ cm} \times 7 \text{ cm} \times \frac{1}{4} = 77 \text{ cm}^2 \end{aligned}$$

$$\text{Area of figure} \rightarrow (77 + 196 - 77) \text{ cm}^2 = 196 \text{ cm}^2$$

Answer: 196 square cm

The figure is made up of three circles and two semi-circles. O is the center of the circle. AB is 42 cm. Find the total area of the shaded part.

(Take $\pi = \frac{22}{7}$)

