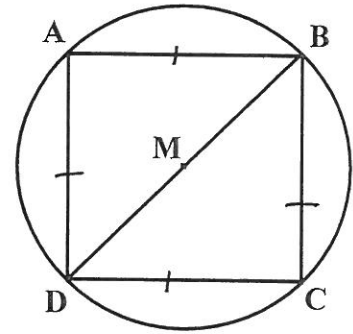


- (1) ABCD is a square with AB 5 cm.
M is the midpoint of the circle.

Calculate:

- (a) The length of BD, approximated to the nearest integer.
(b) The area of the circle, correct to one decimal.



(a) In $\triangle ABD$:

$$\begin{aligned} BD^2 &= AB^2 + AD^2 \quad [\text{Pythagoras}] \\ &= (5)^2 + (5)^2 \\ &= 25 + 25 \end{aligned}$$

$$BD^2 = 50$$

$$BD \approx 7 \text{ cm}$$

$$\begin{aligned} (b) \text{ radius} &= \frac{1}{2} BD = \frac{1}{2} \times 7 \\ &= 3,5 \text{ cm} \end{aligned}$$

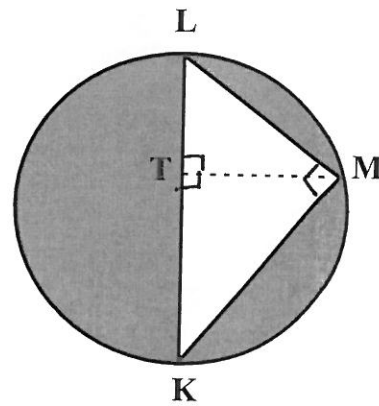
$$\begin{aligned} \text{Area } \odot &= \pi r^2 \\ &= \pi (3,5)^2 \\ &= 38,4845\dots \end{aligned}$$

$$\text{Area } \odot \approx 38,5 \text{ cm}^2$$

- (2) LK is the diameter of the circle.
 $TM \perp LK$ and $LM \perp KM$
 $LM = 60$ mm and $KM = 80$ mm.

Calculate:

- the area of $\triangle LKM$.
- the length of LK.
- the length of TM.
- the area of the shaded section.



$$\begin{aligned} \text{(a) Area } \triangle LKM &= \frac{1}{2} b \times h \\ &= \frac{1}{2} (60) \times (80) \\ &= 2400 \text{ mm}^2 \end{aligned}$$

$$\begin{aligned} \text{(b) } LK^2 &= LM^2 + MK^2 \quad [\text{Pythagoras}] \\ LK^2 &= (60)^2 + (80)^2 \\ &= 3600 + 6400 \\ LK^2 &= 10000 \\ \therefore LK &= 100 \end{aligned}$$

$$\begin{aligned} \text{(c) Area } \triangle LKM &= \frac{1}{2} b \times h \\ 2400 &= \frac{1}{2} (100) \times TM \\ \therefore TM &= \frac{2400}{50} \\ \therefore TM &= 48 \text{ mm} \end{aligned}$$

$$\begin{aligned} \text{(d) Area circle} &= \pi r^2 \quad (r = \frac{1}{2} LK = 50) \\ &= \pi (50)^2 \approx 7853.98 \text{ mm}^2 \end{aligned}$$

$$\begin{aligned} \therefore \text{Area shaded section} &= 7853.98 - 2400 \\ &\approx 5453.98 \text{ mm}^2 \end{aligned}$$

(3) Calculate the area of the circle with a circumference of 308 cm.

$$\text{perimeter } \odot = 2\pi r$$

$$308 = 2\pi r$$

$$\therefore r = \frac{308}{2\pi}$$

$$\therefore r = 49$$

$$\therefore \text{Area } \odot = \pi r^2$$

$$= \pi (49)^2$$

$$\approx 7542,96 \text{ cm}^2$$

(4) A rectangular floor with dimensions 5 m $\times$ 7 m, has to be tiled. The tiles are squares with sidelength 75 cm.

If the price of one tile is R18,20, calculate the total cost to tile the floor.

$$\text{Area floor} = 5\text{ m} \times 7\text{ m} = 35 \text{ m}^2$$

$$\text{Sidelength tile} = 75 \text{ cm} = 0,75 \text{ m}$$

$$\text{Area tile} = (0,75\text{ m})^2 = 0,5625 \text{ m}^2$$

$$\text{Number of tiles} = \frac{35 \text{ m}^2}{0,5625}$$

$$= 62,22\dots$$

$$\therefore 63 \text{ tiles (Round up!)}$$

$$\therefore \text{Cost} = 63 \text{ tiles} \times \text{R}18,20$$

$$= \text{R}1146,60$$