

Take-Up Circle Word Problems from Circles 3 Handout

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- 2). Paul goes for a short cycle ride. Each wheel on his bike has a radius of 27 cm. His distance counter tells him the wheel has rotated 650 times. Find how far he has travelled in metres.

$$C = 2\pi r$$

$$C = 2 \times 3.14 \times 27$$

$$C = 169.56 \text{ cm [one rev]}$$

$$\begin{aligned} \Rightarrow & 650 \text{ rotations} \\ & = 650 \times 169.56 \\ & = 110214 \text{ cm} \end{aligned}$$

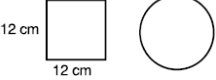
$$\begin{aligned} \Rightarrow & \text{Convert to m} \rightarrow \div 100 \\ & = 1102.14 \text{ m} \end{aligned}$$

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4). The square and the circle have the same area.

a). Find the radius of the circle.

b). What is the circumference of the circle?



12 cm
12 cm

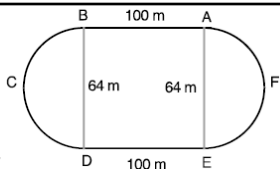
a) $A_{\square} = l \times w$
 $= 12 \times 12$
 $= 144 \text{ cm}^2 = A_{\circ}$

$A_{\circ} = \pi r^2$
 $\frac{144}{3.14} = \frac{3.14 \times r^2}{3.14}$
 $45.85987261 = r^2$
 $\sqrt{45.85987261} = r = 6.77 \text{ cm}$

b) $C = 2\pi r$
 $C = 2 \times 3.14 \times 6.77$
 $= 42.5 \text{ cm}$

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6). The diagram shows a running track. BA and DE are parallel and straight. They are 100 m long. BCD and EFA are semicircular. They each have a diameter of length 64 m.



a). Calculate the perimeter of the track.

b). Calculate the total area enclosed inside the track.

a) Perimeter = distance around the track.

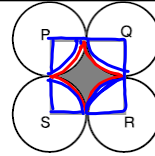
$= \pi d + 100 + 100$
 $= 3.14 \times 64 + 100 + 100$
 $= 400.96 \text{ m}$

b) Area = space inside the track.

$= 2 \text{ semi circles} + \text{rectangle}$
 $= \pi r^2 + l \times w$
 $= 3.14 \times \left(\frac{64}{2}\right)^2 + 100 \times 64$
 $= 3215.36 + 6400$
 $= 9615.36 \text{ m}^2$

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- 7). a). A circle has a radius of 34 cm. Calculate its circumference.
 b). The diagram shows four touching circles. Each circle has a radius of 34 cm. P, Q, R and S are centres of the circles and PQRS is a square.
 i). What is the perimeter of the shaded region?
 ii). Calculate the area of the shaded region.



$$\begin{aligned} \text{a)} \quad C &= 2\pi r \\ &= 2 \times 3.14 \times 34 \\ &= 213.52 \text{ cm} \end{aligned}$$

b) Made from four quarter circles

$$\begin{aligned} \text{(i) Perimeter} &= 2\pi r \\ &= 2 \times 3.14 \times 34 \\ &= 213.52 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{(ii) Area} &= \text{Square} - 4 \text{ quarter circles} \\ &= 68 \times 68 - 3.14 \times 34^2 \\ &= 4624 - 3629.84 \quad [l^2 - \pi r^2] \\ &= 994.16 \text{ cm}^2 \end{aligned}$$

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