

Solutions

Each answer shows the steps, then the **result**.

2.1

- Toward the centre of the circle

2.2

- $F_c = \frac{mv^2}{r} = \frac{3(4)^2}{2} = 24 \text{ N}$

2.3

- Friction (between the tyres and the road)

2.4

- $a_c = \frac{v^2}{r} = \frac{6^2}{3} = 12 \text{ m s}^{-2}$

3.1 B

- the centripetal force points toward the centre

3.2 B

- $F_c \propto v^2$, so doubling v gives $2^2 = 4$ times

3.3

(a)

- $F_c = \frac{0.5(3)^2}{1} = 4.5 \text{ N}$

(b)

- The tension in the string

3.4

(a)

- $a_c = \frac{10^2}{50} = 2 \text{ m s}^{-2}$

(b)

- $F = ma_c = 1000 \times 2 = 2000 \text{ N}$