Foundation Tier

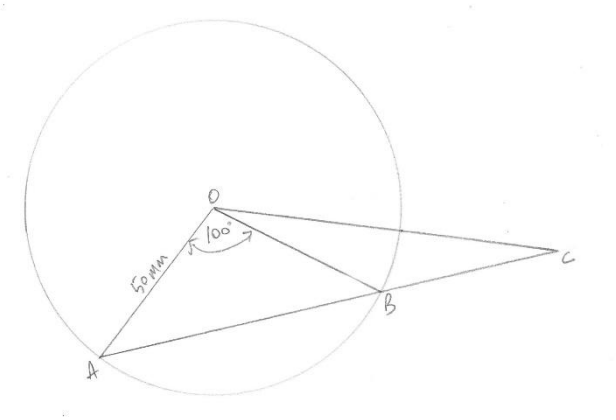
The diameter of Mike's mountain bike wheel is 68cm.

a) What is the radius of the wheel?
b) What is the circumference of the wheel (to 3sf)?
c) A circular storage case is being made.
   What is the wheel's area (to 2dp)?
d) How many <u>full</u> revolutions does the wheel make across 1km?

In 30 minutes, Mike's wheels have turned a full 6452 times.

e) How many cm has he travelled (to 3sf)?
f) Convert your answer in e) to km.

Higher Tier



A circle, centre O, has a radius of 50mm.
∠AOB = 100°

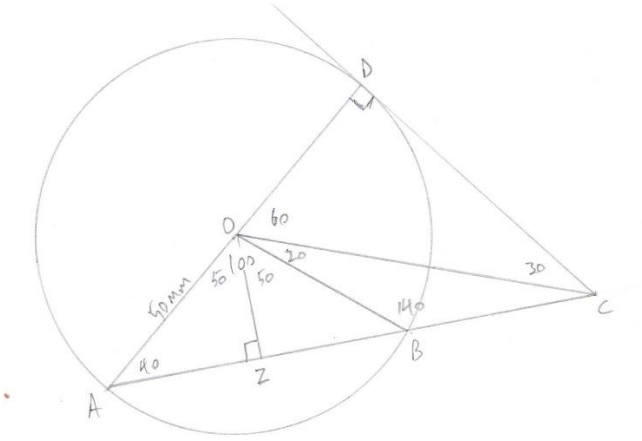
a) What is the shortest distance from O to the chord AB (to 2dp)?
b) What is the length of the chord AB (to 2dp)?
c) What is the size of ∠OBC?
d) Radius AO is extended to form a diameter AD.
   CD is a tangent to the circle. ∠AOC = 120°
   What is the size of ∠OCD

<u>Answers</u>:

Foundation:

a) 34cm (radius is half the diameter)
b) 214 cm ($\pi \times 68 = 213.626...$)
c) 3631.68cm^2 ($\pi \times 34^2 = 3631.6811...$)
d) 467 (1km=100000cm, so $\frac{100000}{214} = 467.38...$)
e) 1390000cm ($6452 \times 214 = 1396136$)
f) 13.9km

Higher:



a) 32.12mm $\left(\sin(40)=\frac{OZ}{50}, OZ=\sin(40)\times 50=32.12\right)$

b) 76.60mm $(AB=2\times AZ, AZ=\sin(50)\times 50$
$AB=2\times\sin(50)\times 50=76.60)$

c) 140° (180-40)

d) 30° (If ∠AOC = 120° then ∠DOC=180-120=60°
∠ODC=90° - angle between tangent and radius
∠OCD=180-90-60=30° - angle in a triangle=180°)