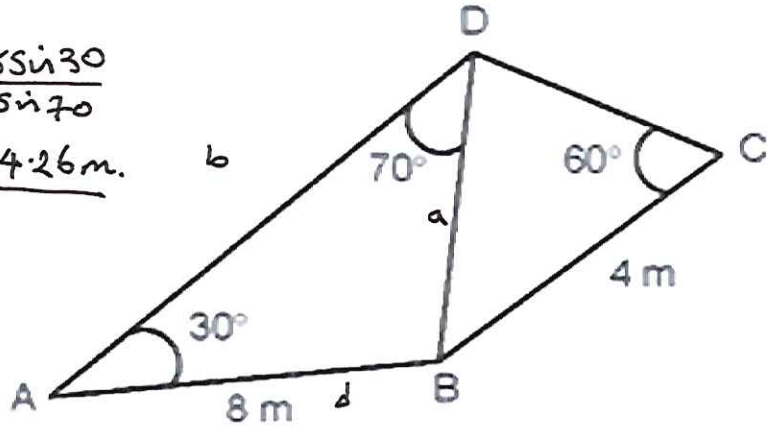
For you to try now

Question 1

The diagram below is a sketch of a metal framework with some of the manufacturing information missing. In the triangular frame AB = 8m, BC = 4m, ∠BAD = 30°, ∠ADB = 70° and ∠BCD = 60°, calculate:



a) BD

a) $\frac{a}{\sin 30} = \frac{d}{\sin 70}$ $\quad a = \frac{8 \sin 30}{\sin 70}$

$a = 4.26\text{m}.$

b) Angle BDC

b) $\frac{BC}{\sin BDC} = \frac{BD}{\sin 60}$

$\frac{4.26 \sin 60}{4} = \sin BDC$

$= 67.3^\circ$

c) DC

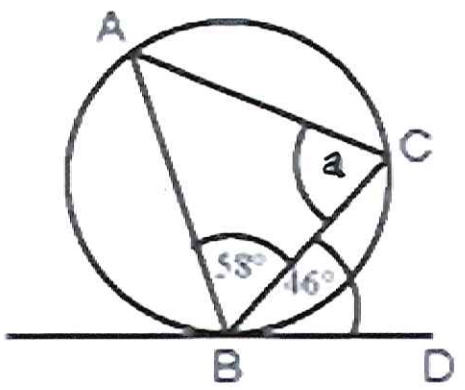
c) $\angle DBC = 52.7^\circ$

$\frac{DC}{\sin 52.7} = \frac{4.26}{\sin 60}$ $\quad DC = 3.91\text{ m}$

Question 2

The line BD is a tangent to the circle at the point B.
Calculate the size of angle a.

Give reasons for your answers.



$\angle BAC = \angle DBC$ alternate segment theorem

$= 46^\circ$

$\therefore \angle ACB = 76^\circ$ Angles in a triangle add to 180°

Question 3

ABCD is a cyclic quadrilateral and the tangent to the circle at A makes an angle of 63° with side AD. Angle BCA = 28°.

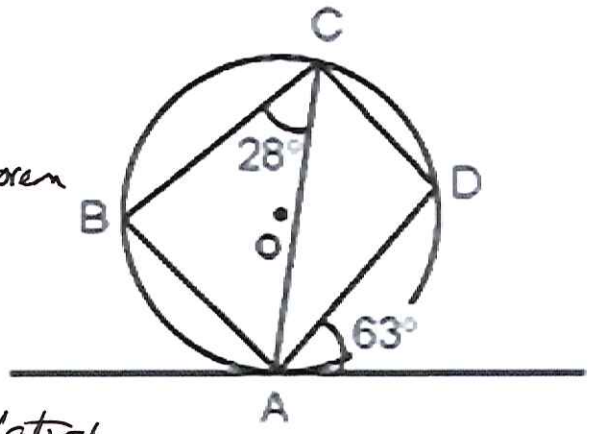
Write down the size of:

i) Angle ACD $= 63^\circ$ Alternate Segment Theorem

ii) Angle BAD

$\angle BCD = 91^\circ$ $(\angle BCA + \angle ACD)$

$\angle BAD = 89^\circ$ → opposite angles in a cyclic quadrilateral add to 180°



Give a reason for each of your answers above.