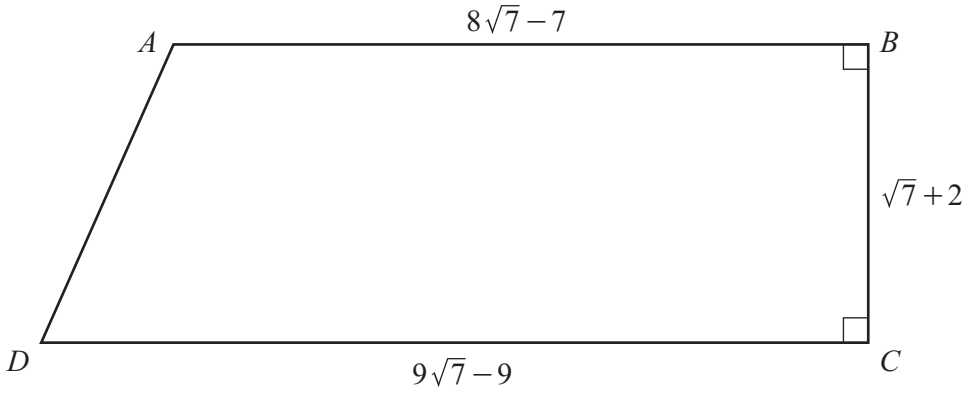
5 DO NOT USE A CALCULATOR IN THIS QUESTION.

In this question, all lengths are in centimetres.



The diagram shows the trapezium $ABCD$. The lengths of AB, BC and CD are $8\sqrt{7}-7$, $\sqrt{7}+2$ and $9\sqrt{7}-9$ respectively. The line BC is perpendicular to the lines AB and CD.

(a) Find the perimeter of the trapezium, giving your answer in its simplest form. [3]

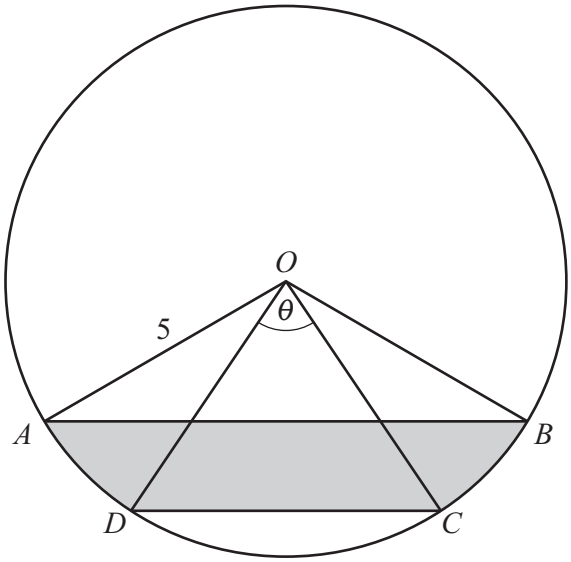
(b) Find the area of the trapezium, giving your answer in the form $p\sqrt{7}+q$, where p and q are rational numbers. [3]

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(c) Find $\cot DBC$, giving your answer in the form $r\sqrt{7}+s$, where r and s are simplified rational numbers. [3]

6 In this question, all lengths are in metres and all angles are in radians.



The diagram shows a circle with centre O and radius 5. The points A, B, C and D lie on the circumference of the circle. Angle $DOC = \theta$. Angle AOD = angle $COB = 0.5$. The length of the minor arc DC is 3.75.

(a) Show that $\theta = 0.75$. [1]

(b) Find the perimeter of the shaded region. [5]

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