6

The diagram shows a circle with centre O and radius r cm. The points A and B lie on the circle and AT is a tangent to the circle. Angle $AOB = \theta$ radians and OBT is a straight line.

(i) Express the area of the shaded region in terms of r and θ. [3]

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(ii) In the case where $r = 3$ and $\theta = 1.2$, find the perimeter of the shaded region. [4]