

In the diagram, OAB is a sector of a circle with centre O and radius 2r, and angle  $AOB = \frac{1}{6}\pi$  radians. The point C is the midpoint of OA.

(a)	Show that the exact length of $BC$ is $r\sqrt{5-2\sqrt{3}}$ .	[2]

(b)	Find the exact perimeter of the shaded region.	[2]
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(c)	Find the exact area of the shaded region.	[3]
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(c)		

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