

(a) Show that the area of the shaded region is approximately $0.614r^2 \text{ cm}^2$. [2]

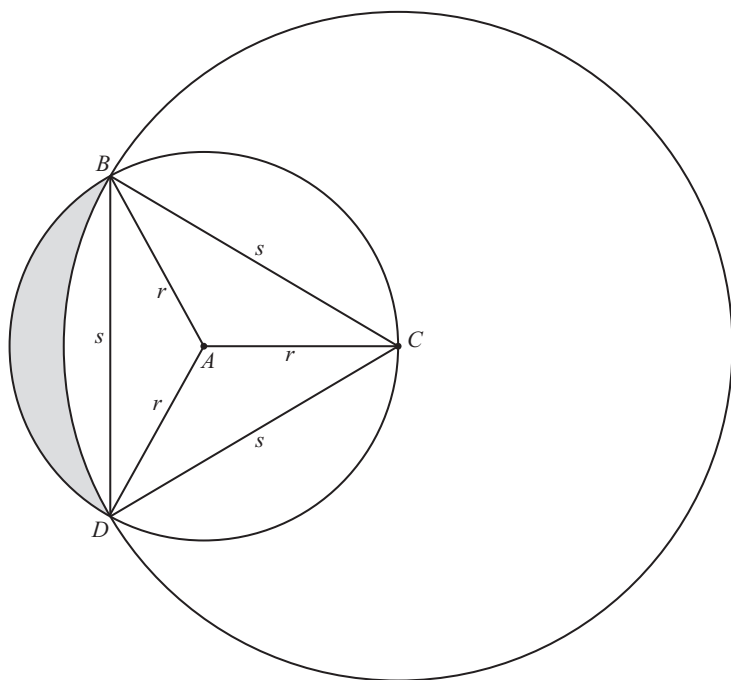
[illegible]

(b) (i) Find the rate of increase of the area of the shaded region at the instant when $r = 20$.
Give your answer correct to 2 significant figures. [3]

[illegible]

(ii) Find the rate of increase of the length of the arc AB . Give your answer correct to 2 significant figures. [3]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. At the bottom center, there is a small circular icon containing the number 2.



(a) Show that $s = \sqrt{3}r$. [2]

[2]

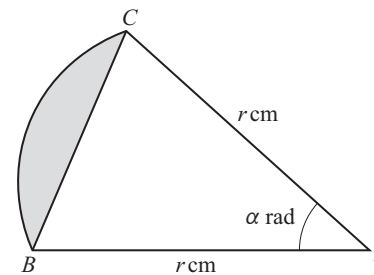
This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

Additional page

If you use the following page to complete the answer to any question, the question number must be clearly shown.

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

9



The diagram shows a sector ABC of a circle with centre A and radius r cm. The angle BAC is α radians, where $0 < \alpha < \frac{1}{2}\pi$.

- (a) It is given that the area of the triangle ABC is 4 cm^2 and the area of the sector ABC is $8\alpha \text{ cm}^2$.

Find the exact area of the shaded segment.

[4]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

[illegible]