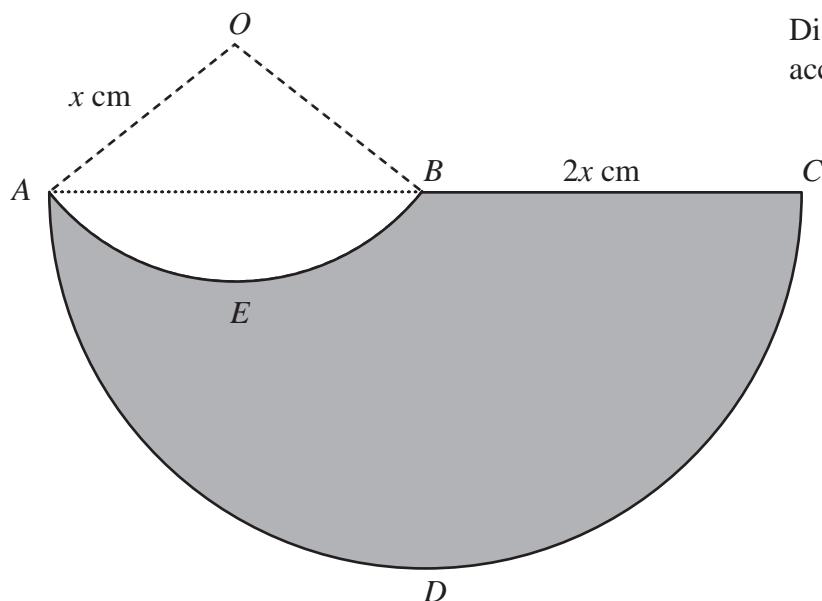**9**

Diagram **NOT** accurately drawn

Figure 2

A logo, *AEBCD*, is shown shaded in Figure 2.

The straight line *ABC* is the diameter of the semicircle *ADC*
AEB is an arc of a circle with centre *O*
All angles are measured in radians.

- $BC = 2x$ cm

- $OA = OB = x$ cm

- length of arc $AEB = 1.8x$ cm

The perimeter of the logo is *P*

(a) Show that $P = ax\left(\pi + \pi\sin 0.9 + b\right)$ where *a* and *b* are constants to be found.

(7)

Given that $x = 10$ cm,

(b) find, in cm² to 3 significant figures, the area of the logo.

(6)

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Question 9 continued

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Question 9 continued

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P 7 3 5 8 6 A 0 2 4 3 2

Question 9 continued

(Total for Question 9 is 13 marks)