

Name

Current school



WELLINGTON
COLLEGE

13+ SCHOLARSHIP EXAMINATION 2023

MATHEMATICS

TIME ALLOWED: 90 minutes

The marks available for each question are shown in square brackets.

This paper is divided into two sections:

Section A is worth 30 marks and contains seven questions. You should attempt all questions in Section A.

Section B is worth 60 marks and contains six questions. You may attempt all questions. Start with the ones that interest you most; answer as many questions as you can. You may find some easier than others.

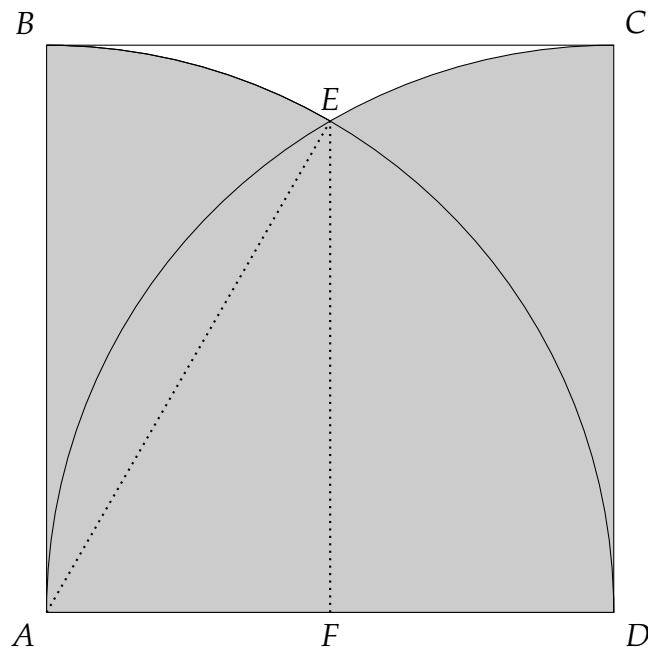
Write your answers on the question paper.

You may use a calculator.

Credit will be given for the clarity of your work and your explanations.

Section B (60 marks)

8. A square $ABCD$ of side 12 cm is drawn and two circular arcs are drawn inside it, one centred on A and passing from B to D and another centred on D and passing from A to C . The area below the arcs is shaded, as illustrated.



The arcs meet at E .

- (a) Write down the length of the straight line AE . [1]
- (b) Hence, explaining your reasoning, give the size of angle EAD . [2]
- (c) Leaving your answer as a multiple of π , give the area of the sector ABE (i.e. the area bounded by the straight lines AB and AE and the arc BE). [2]
- (d) Find the length EF , leaving your answer in the form \sqrt{n} , where n is a constant to be found. [2]
- (e) Hence find, in an exact form, the area of the square which remains unshaded. [5]

