

The number 2021 can be expressed as a product of two consecutive prime numbers:  $43 \times 47 = 2021$ .

Consider the complex equation  $z^{43} = 1$ .

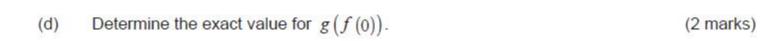
(a) Write an expression for the roots of  $z^{43} = 1$ .

(2 marks)

Let w be any one of the roots of the equation  $z^{43} = 1$ .

(b) How many of these roots will also be a solution of the equation  $z^{47} = 1$ ? Justify your answer.

(3 marks)



(e) Determine the domain for the function y = f(g(x)). Justify your answer. (3 marks)

(i)	A and B.	(1 mark)
(ii)	C and D.	(1 mark)