

Question 9**(6 marks)**

Consider the complex equation $z^n = 1$ where n is a positive integer.

- (a) Show that $z = \frac{1+i}{\sqrt{2}}$ will be a solution of $z^{24} = 1$. (2 marks)

- (b) Determine all the values of n so that $z = \frac{1+i}{\sqrt{2}}$ is a solution of $z^n = 1$. (2 marks)

Consider the smallest value of n from part (b).

- (c) Explain how you could locate all the solutions to the equation $z^n = 1$ in the Argand plane for this smallest value of n . (2 marks)