Question 14 (7 marks)

Consider the complex equation $z^4 = -16i$.

(a)   Solve the equation giving all solutions in the form $r\operatorname{cis}\theta$ where $-\pi < \theta \le \pi$.   (4 marks)

Let w be the solution to $z^4 = -16i$ that has the least positive argument.

(b)   Determine the value for $arg\ (w + 2)$.   (3 marks)