

**Advanced Higher Maths**  
**SQA 2021 Paper 2**  
**Question 7**



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A complex number is defined by  $z = a + 2i$  where  $a$  is a positive real number.

- (a) State and simplify the binomial expansion of  $z^3$ . **3**
- (b) Given that  $z^3 + 3z = b + 148i$ , where  $b$  is a real number, find the values of  $a$  and  $b$ . **3**
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Answers:

(a)  $a^3 - 12a + (6a^2 - 8)i$

(b)  $a = 5, b = 80$