

**Further Vectors – 2022 GCE Additional Pure Further Math A Y545****1. June/2022/Paper\_Y545/01/No.5**

You are given the variable point  $A(3, -8, t)$ , where  $t$  is a real parameter, and the fixed point  $B(1, 2, -2)$ .

- (a) Using only the geometrical properties of the vector product, explain why the statement “ $\vec{OA} \times \vec{OB} = \mathbf{0}$ ” is false for all values of  $t$ . [2]
- (b) (i) Use the vector product to find an expression, in terms of  $t$ , for the area of triangle  $OAB$ . [4]
- (ii) Hence determine the value of  $t$  for which the area of triangle  $OAB$  is a minimum. [2]