

**3 (a)** Find a counterexample to disprove the statement that the product of two prime numbers is always odd. **[1]**

**(b)** In each of the following cases write one of the symbols  $\Rightarrow$ ,  $\Leftrightarrow$ ,  $\Leftarrow$  in the box in the Printed Answer Booklet to make each statement correct.

**(i)**  $x^2 = 3x$    $x = 3$  **[1]**

**(ii)**  $x > 4$    $x^3 > 64$  **[1]**

**(iii)**  $x^\circ = 45^\circ$    $\tan x^\circ = 1$  **[1]**

**(c)** Prove that the sum of the squares of **any** two odd numbers is always a multiple of 2 but never a multiple of 4. **[4]**