

**4** In this question you must show detailed reasoning.

The functions  $f$  and  $g$  are defined for all real values of  $x$  by

$$f(x) = x^3 \quad \text{and} \quad g(x) = x^2 + 2.$$

**(i)** Write down expressions for

**(a)**  $fg(x)$ , **[1]**

**(b)**  $gf(x)$ . **[1]**

**(ii)** Hence find the values of  $x$  for which  $fg(x) - gf(x) = 24$ . **[6]**