**7.**

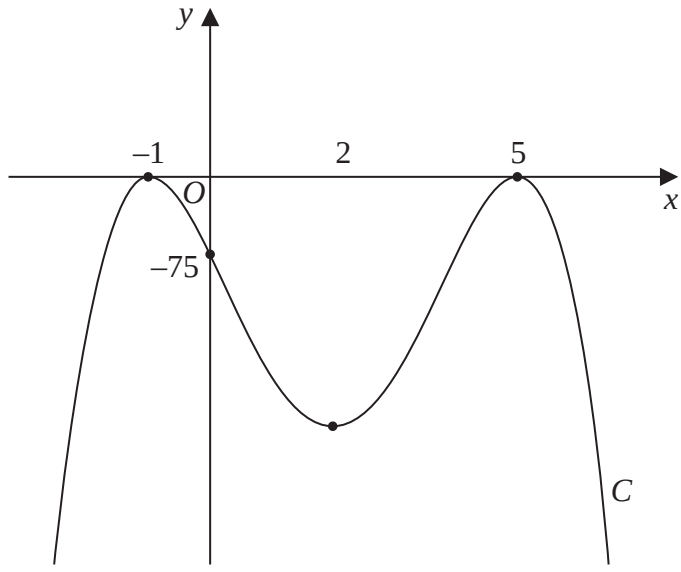


**Figure 1**

Figure 1 shows a sketch of a curve $C$ with equation $y = \mathrm{f}(x)$, where $\mathrm{f}(x)$ is a quartic expression in $x$.

The curve

- has maximum turning points at $(-1, 0)$ and $(5, 0)$
- crosses the $y$-axis at $(0, -75)$
- has a minimum turning point at $x = 2$

(a) Find the set of values of $x$ for which

$$\mathrm{f}'(x) \geqslant 0$$

writing your answer in set notation.

**(2)**

(b) Find the equation of $C$. You may leave your answer in factorised form.

**(3)**

The curve $C_1$ has equation $y = \mathrm{f}(x) + k$, where $k$ is a constant.

Given that the graph of $C_1$ intersects the $x$-axis at exactly four places,

(c) find the range of possible values for $k$.

**(2)**