

4.

$$f(x) = x^4 - 2x^3 - 11x^2 + 12x + 36$$

(a) Use the factor theorem to show that  $(x - 3)$  is a factor of  $f(x)$

**(2)**

Given that  $f(x) = (x - 3)^2(x + a)^2$ , where  $a$  is a positive constant,

(b) deduce the value of  $a$

**(1)**

(c) Sketch the curve with equation  $y = f(x)$ , indicating clearly on your sketch the coordinates of the points at which the curve crosses or meets the axes.

**(4)**