

8. A curve  $C$  has equation  $y = f(x)$

Given that

- $f'(x) = 6x^2 + ax - 23$  where  $a$  is a constant
- the  $y$  intercept of  $C$  is  $-12$
- $(x + 4)$  is a factor of  $f(x)$

find, in simplest form,  $f(x)$