

## STEP II, 2000, Q2

- 2 Prove that if  $(x - a)^2$  is a factor of the polynomial  $p(x)$ , then  $p'(a) = 0$ . Prove a corresponding result if  $(x - a)^4$  is a factor of  $p(x)$ .

Given that the polynomial

$$x^6 + 4x^5 - 5x^4 - 40x^3 - 40x^2 + 32x + k$$

has a factor of the form  $(x - a)^4$ , find  $k$ .



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