7: **In this question you must show all stages of your working.**
Solutions relying entirely on calculator technology are not acceptable.

The binomial expansion, in ascending powers of x, of $(1 + kx)^n$ is

$$1 - 24x + 270x^2 + px^3 + ...$$

where k and p are constants and n is an integer greater than 1

(a) Use this information to set up and solve two simultaneous equations to find the value of k and the value of n.

(6)

(b) Hence find the value of p.

(2)

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Question 7 continued

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Question 7 continued

(Total for Question 7 is 8 marks)

8: **In this question you must show all stages of your working.**
Solutions relying entirely on calculator technology are not acceptable.

A curve C has equation $y = f(x)$ where $f(x)$ is a polynomial in x.

Given

$$f'(x) = 2(3x - 2)(x + 5)$$

(a) deduce the range of values of x for which y is decreasing.

(2)

Given further that C cuts the x-axis at $\frac{7}{2}$

(b) state a factor of $f(x)$, giving the answer in the form $(Ax + B)$ where A and B are integers.

(1)

(c) Hence find an expression for $f(x)$ in a fully factorised form.

(6)

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