1. Given that a, b and c are integers greater than 0 such that

- $c = b + 2$
- $a + b + c = 10$

Prove, by exhaustion, that the product of a, b and c is always even.

You may use the table below to illustrate your answer.

(3)

You may not need to use all rows of this table.

a	b	c
	1	
	2	

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Question 1 continued

(Total for Question 1 is 3 marks)

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

$$f(x) = (2 - kx)^5$$

and k is a constant.

Given that when $f(x)$ is divided by $(4x - 5)$ the remainder is $\frac{243}{32}$

(a) show that $k = \frac{2}{5}$

(2)

(b) Find the first three terms, in ascending powers of x, of the binomial expansion of

$$\left(2 - \frac{2}{5}x\right)^5$$

giving each term in simplest form.

(3)

Using the solution to part (b) and making your method clear,

(c) find the gradient of C at the point where $x = 0$

(2)

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