

**1. June/2023/Paper\_9709/11/No.2**

(a) Find the first three terms in the expansion, in ascending powers of  $x$ , of  $(2 + 3x)^4$ . [2]

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(b) Find the first three terms in the expansion, in ascending powers of  $x$ , of  $(1 - 2x)^5$ . [2]

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(c) Hence find the coefficient of  $x^2$  in the expansion of  $(2 + 3x)^4(1 - 2x)^5$ . [2]

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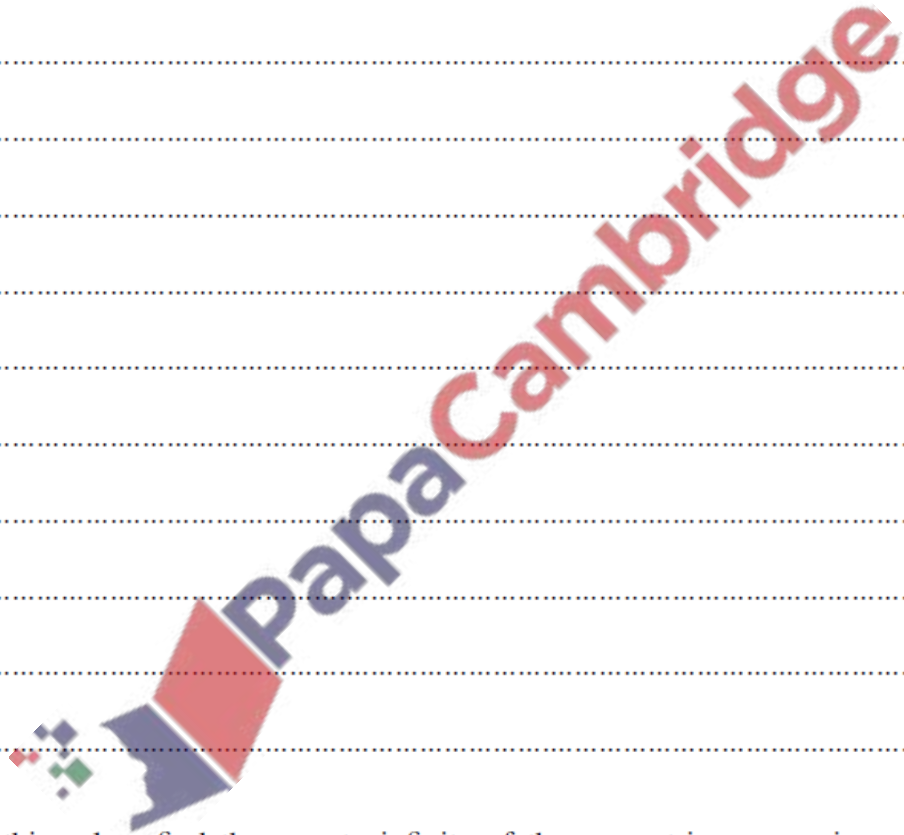
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The first three terms of an arithmetic progression are  $\frac{p^2}{6}$ ,  $2p - 6$  and  $p$ .

- (a) Given that the common difference of the progression is not zero, find the value of  $p$ . [3]

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- (b) Using this value, find the sum to infinity of the geometric progression with first two terms  $\frac{p^2}{6}$  and  $2p - 6$ . [2]

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- (a) Give the complete expansion of  $\left(x + \frac{2}{x}\right)^5$ . [2]

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- (b) In the expansion of  $(a + bx^2)\left(x + \frac{2}{x}\right)^5$ , the coefficient of  $x$  is zero and the coefficient of  $\frac{1}{x}$  is 80. Find the values of the constants  $a$  and  $b$ . [4]

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