

## **Permutations/Combinations/Binomial Theorem**

**January 2014**

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Question 4 (calculator)

2 marks

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Find and simplify the last term in the expansion of  $(2y - 3x)^7$ .

Question 6

2 marks

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How many different ways can 4 girls and 4 boys be arranged in a row if the girls and the boys must alternate?

**Question 28****3 marks**

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Solve the following equation:

$${}_n P_2 = {}_n C_3$$

**Question 38****2 marks**

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Evaluate the coefficient of the term containing  $x^3$  in the expansion of  $(1 + x)^7$ .

Justify your answer.

**June 2013**

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**Question 4 (calculator)****3 marks**

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The 4<sup>th</sup> term in the binomial expansion of  $\left(qx^2 - \frac{3}{x}\right)^{10}$  is  $414\,720x^{11}$ .

Determine the value of  $q$  algebraically.

**Question 5****1 mark**

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Bella has 2 pairs of shoes, 3 pairs of pants, and 10 shirts.

Carey has 4 pairs of shoes, 4 pairs of pants, and 4 shirts.

An outfit is made up of one pair of shoes, one pair of pants, and one shirt.

Who can make more outfits? Justify your answer.

**Question 6****2 marks**

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In the binomial expansion of  $(x - y)^{10}$ , how many terms will be positive?

Justify your answer.

**Question 16****3 marks**

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Solve algebraically:

$${}_n C_2 = 4n + 5$$