

GCSE to A-level Maths Transition

Name:

Algebraic Manipulation and Proof (1)

Q1. Expand and simplify $(2x + 5y)(3x - 8y)$

Answer _____

(Total 3 marks)

Q2. Expand and simplify fully $(x - 3)(x + 2)(x + 5)$

Answer _____

(Total 3 marks)

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(Total 4 marks)

$$(x - 3)^2 \equiv x^2 - 6x + 9$$

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Q5. Work out the values of a and b in the identity

$$5(7x + 8) + 3(2x + b) \equiv ax + 13$$

$$a = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

(Total 4 marks)

Q6. Prove that $3(x + 1)(x + 7) - (2x + 5)^2$ is never positive.

(Total 5 marks)

Q7. Expressions for consecutive triangular numbers are

$$\frac{n(n+1)}{2} \quad \text{and} \quad \frac{(n+1)(n+2)}{2}$$

Prove that the sum of two consecutive triangular numbers is always a square number.

(Total 4 marks)

Q8. Two integers have a difference of 3.

The difference between the squares of the two integers is three times the sum of the integers.

For example, $13 - 10 = 3$, $13^2 - 10^2 = 169 - 100 = 69$

And $3 \times (13 + 10) = 3 \times 23 = 69$

Prove this result algebraically.

(Total 4 marks)