

AQA, OCR, Edexcel

GCSE

GCSE Maths

Proof Questions

Name:

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Total Marks:

Proof

1. The n^{th} even number is $2n$.
 - a. The next even number can be written as $2n + 2$
Explain why
 - b. Write down an expression, in terms of n , for the next even number after $2n + 2$.
 - c. Show algebraically that the sum of any 3 consecutive even numbers is always a divisible by 6

(3 Marks)

2. Prove, using algebra, that the sum of two consecutive integers is always odd.

(2 Marks)

3. Prove algebraically that $(4n + 2)^2 - (2n + 2)^2$ is a multiple of 4 for all positive integers.

(4 Marks)

4. Prove that $(2n + 3)^2 - (2n - 3)^2$ is a multiple of 8 for all positive integers of n .

(3 Marks)

5. Prove algebraically that $(3n + 1)(n + 3) - n(3n + 7) = 3(n + 1)$

(3 Marks)

6. Prove Algebraically that $\frac{1}{8}(4n + 1)(n + 8) - \frac{1}{8}n(4n + 1) = 4n + 1$

(4 Marks)

7. Prove algebraically that the sum of two consecutive square numbers is twice the product of two consecutive numbers +1.

(4 Marks)

8. Prove algebraically that the sum of 4 consecutive square numbers is divisible by 4 remainder 2.

(5 Marks)

9. Show that the difference between 14^{20} and 21^2 is a multiple of 7.

(3 Marks)

10. Tom says that $7x - (2x + 3)(x + 2)$ is always negative. Is he correct? Explain your answer.

(3 Marks)

11. Show that $3^{60} - 25$ is not a prime.

(3 Marks)