Name:_____

GCSE (1 - 9) Proof	Solutions:

These questions are compiled from released Pearson Edexcel GCSE maths exam papers

They contain exam questions from up until the ***November 2023*** exam series

More recent exam papers do exist but are withheld for mock exams

As new exam papers are released these worksheets will gradually be updated

The **most current** version of these worksheets will always be available at: kennethstafford.co.uk

Past Papers:	**Similar Worksheets:**
Solutions:	**This worksheet:**

1

n is an integer greater than 1

Prove algebraically that $n^2 - 2 - (n - 2)^2$ is always an even number.

(Total for Question 16 is 4 marks)

[Edexcel, GCSE, Summer 2017, Paper 1H, Q16]

2

n is an integer.

Prove algebraically that the sum of $\frac{1}{2}n(n + 1)$ and $\frac{1}{2}(n + 1)(n + 2)$ is always a square number.

(Total for Question 17 is 2 marks)

[Edexcel, GCSE, Autumn 2017, Paper 1H, Q17]

3

Prove that the square of an odd number is always 1 more than a multiple of 4

(Total for Question 12 is 4 marks)

[Edexcel, GCSE, Summer 2018, Paper 1H, Q12]

4

Prove algebraically that the difference between the squares of any two consecutive odd numbers is always a multiple of 8

(Total for Question 15 is 3 marks)

[Edexcel, GCSE, Autumn 2018, Paper 3H, Q15]

5

Given that n can be any integer such that $n > 1$, prove that $n^2 - n$ is never an odd number.

(Total for Question 13 is 2 marks)

[Edexcel, GCSE, Summer 2019, Paper 1H, Q13]

6

Prove algebraically that the sum of the squares of any two consecutive even numbers is always a multiple of 4

(Total for Question 15 is 3 marks)

[Edexcel, GCSE, Autumn 2019, Paper 3H, Q15]

7

An expression for the nth term of the sequence of triangular numbers is $\frac{n(n+1)}{2}$

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

(Total for Question 13 is 3 marks)

[Edexcel, GCSE, Summer 2023, Paper 3H, Q13]

8

(a) Prove that

$$(2m + 1)^2 - (2n - 1)^2 = 4(m + n)(m - n + 1)$$

(3)

Sophia says that the result in part (a) shows that the difference of the squares of any two odd numbers must be a multiple of 4

(b) Is Sophia correct?
You must give reasons for your answer.

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(1)

(Total for Question 16 is 4 marks)

[Edexcel, GCSE, November 2022, Paper 1H, Q16]