

Deductive proof

5 questions · 20 marks

Answer all questions. The marks available are shown against each part. Every question is taken unaltered from a past paper; the source is noted beneath it. Some questions are taken from higher level papers, where they examine the same standard level content.

1. [Maximum mark: 4] 4 marks

Prove that $(3n + 2)^2 - (3n - 2)^2$ is a multiple of 12 for all $n \in \mathbb{Z}^+$.

IB 8824 - 7109 Maths AA · November 2024 Paper 1 TZ2 SL, Question 4

2. [Maximum mark: 4] 4 marks

Consider two consecutive positive integers, n and $n + 1$.

Show that the difference of their squares is equal to the sum of the two integers.

IB 2221 - 7114 Maths AA · May 2021 Paper 1 TZ2 SL, Question 2

3.

[Maximum mark: 4]

4 marks

Prove that $(2n + 5)^2 - (2n - 5)^2$ is a multiple of 10 for all $n \in \mathbb{Z}^+$.

— IB 8824 – 7104 Maths AA · November 2024 Paper 1 TZ1 SL, Question 4

4.

[Maximum mark: 4]

4 marks

Consider two consecutive positive integers, n and $n + 1$.

Show that the difference of their squares is equal to the sum of the two integers.

— IB 2221 – 7111 Maths AA · May 2021 Paper 1 TZ2 HL, Question 1

5.

[Maximum mark: 4]

4 marks

Prove that $(3n + 2)^2 - (3n - 2)^2$ is a multiple of 12 for all $n \in \mathbb{Z}^+$.

— IB 8824 – 9700 Maths AA · November 2024 Paper 1 HL, Question 3

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