



Proof

Questions

Suitable for:
Pearson Edexcel International A-Level (iAL) — Pure Mathematics 4



Question 1

Prove by contradiction that for any integer n , if n^2 is even then n is even.

(4 marks)

Total for question = 4 marks



Question 2

Prove by contradiction that $\sqrt{2}$ is irrational.

(5 marks)

Total for question = 5 marks



Question 3

Prove by contradiction that $\log_2 3$ is irrational.

(4 marks)

Total for question = 4 marks



Question 4

Prove by contradiction that the equation

$$3x^2 + 7 = 0$$

has no real solutions.

(3 marks)

Total for question = 3 marks



Question 5

Prove by contradiction that there is no greatest even integer.

(3 marks)

Total for question = 3 marks



Question 6

Prove by contradiction that $\sqrt{2} + \sqrt{3}$ is irrational.

You may assume that $\sqrt{2}$ is irrational.

(5 marks)

Total for question = 5 marks



Question 7

Prove by contradiction that the sum of a rational number and an irrational number is always irrational.

(4 marks)

Total for question = 4 marks



Question 8

Prove by contradiction that there are infinitely many prime numbers.

(5 marks)

Total for question = 5 marks