1.4 Proof & Reasoning

Question Paper

Course	DP IB Maths
Section	1. Number & Algebra
Topic	1.4 Proof & Reasoning
Difficulty	Hard

Time allowed: 50

Score: /37

Percentage: /100

Question 1

Show that $\frac{1}{n+1} + \frac{1}{n^2+n} = \frac{1}{n}$.

[4 marks]

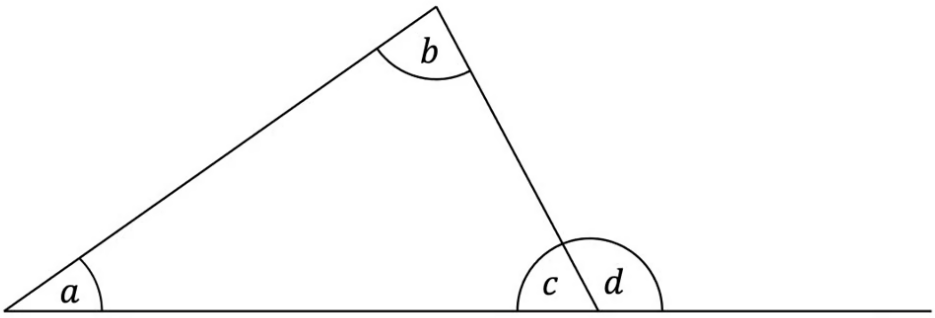
Question 2

For $f(x) = x^2 - 10x + 17$, prove that $f(x) \geq -8$ for all values of x.

[4 marks]

Question 3

Prove that the exterior angle in any triangle is equal to the sum of the two opposite interior angles. You may use the diagram below to help.



[5 marks]

Question 4

Consider the function $f(x) = 5x^2 + 4x + 1$. Show that $f(x)$ is positive for all values of x.

[4 marks]

Question 5

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.

[4 marks]

Question 6

Prove that $(2q - 1)(q - 3) - 3(q - 4)^2 = -q^2 + 17q - 45$.

[4 marks]

Question 7

Prove that the square of an odd number is always odd.

[4 marks]

Question 8

Prove that the sum of the squares of any two consecutive odd integers is even.

[4 marks]

Question 9

Prove that the sum of any three consecutive even numbers is a multiple of 6.

[4 marks]