1 N is a multiple of 5

$A = N + 1$
$B = N - 1$

Prove, using algebra, that $A^2 - B^2$ is always a multiple of 20

2 Prove that the difference between two consecutive square numbers is always an odd number.
Show clear algebraic working.

(Total for Question 2 is 3 marks)

3 Using algebra, prove that, given any 3 consecutive even numbers, the difference between the square of the largest number and the square of the smallest number is always 8 times the middle number.

(Total for Question 3 is 3 marks)

4 Prove algebraically that the product of any two odd numbers is always an odd number.

(Total for Question 4 is 4 marks)

5 Using algebra, prove that, given any 3 consecutive whole numbers, the sum of the square of the smallest number and the square of the largest number is always 2 more than twice the square of the middle number.

(Total for Question 5 is 3 marks)

6 Prove that when the sum of the squares of any two consecutive odd numbers is divided
by 8, the remainder is always 2
Show clear algebraic working.

(Total for Question 6 is 3 marks)

7 Prove algebraically that, for any three consecutive even numbers,

the sum of the squares of the smallest even number and the largest even number is
8 more than twice the square of the middle even number.

(Total for Question 7 is 3 marks)