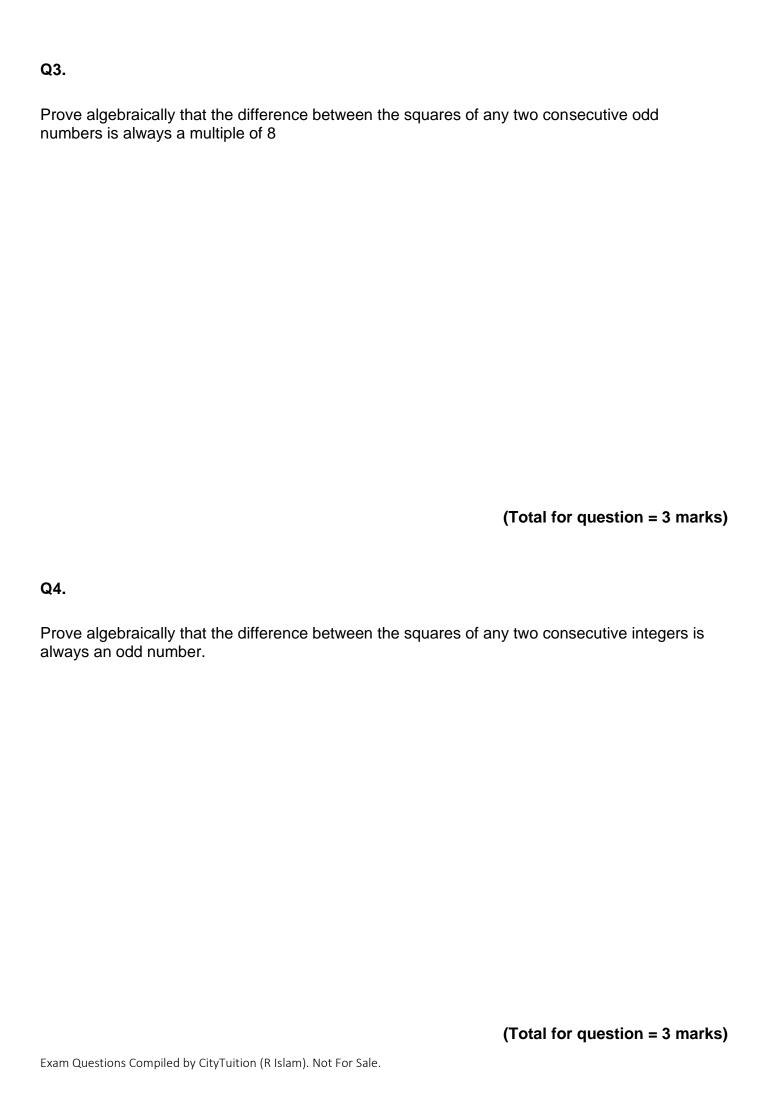
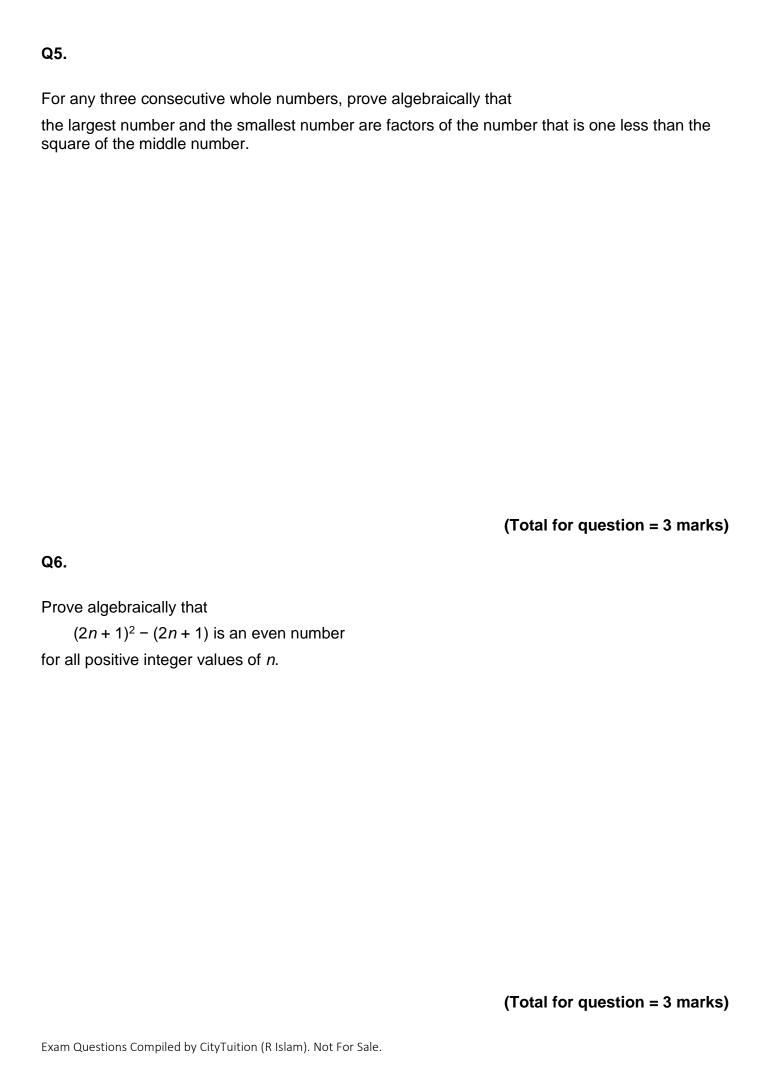
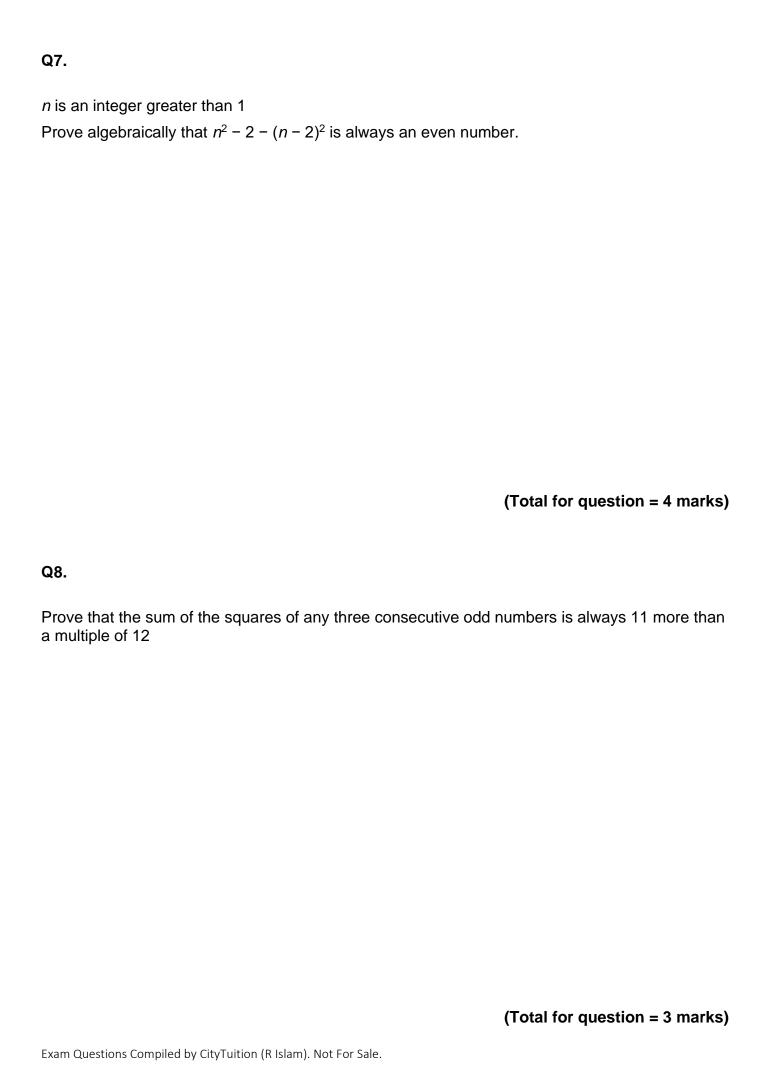
A278 Algebraic proofs
Q1.
Prove algebraically that the sum of the squares of any two consecutive even numbers is always a multiple of 4
(Total for question = 3 marks)
Q2.
Prove algebraically that the difference between the squares of any two consecutive integers is equal to the sum of these two integers.
(Total for question is 4 marks)

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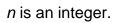












Prove algebraically that the sum of $\frac{1}{2}n(n+1)$ and $\frac{1}{2}(n+1)(n+2)$ is always a square number.

(Total for question = 2 marks)

Q13.

	Here are	the first	five terms	of an	arithmetic	sequence.
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7 13 19 25 31

Prove that the difference between the squares of any two terms of the sequence is always a multiple of 24

(Total for question is 6 marks)

Q14.

a,	b,	c are	positive	integers	such	that	a >	<i>b</i> > <i>c</i>	
	_		_		_	_	_	_	 _

N is the largest three digit number that has the digits a, b and c. K is the smallest three digit number that has the digits a, b and c.

(a) Use algebra to show that the difference between N and K is always a multiple of 99

	(3)
(b) If $a > b$ and $b = c$ will the difference between N and K still be a multiple of 99?	
Justify your answer.	
	(1)

(Total for question = 4 marks)