. :		:									
c is a	i positiv	ve integer.									
Prove	e that			ı number.							
				•••••							
						•••••					
									(То	tal 3 marks	;)
In the	e formu	ula $T = (n + 1)$	$-6)^2 + 1$ n	is a positi	ve integei	r.					
(a)	Kim s	says,									
	Comn	nent on her	statement.								
		•••••	•••••					•••••	•••••		
										(1)
(b)											
(D)	What	is the only	value of <i>T</i> th	nat is a squ	ıare numl	per?					
(b)	What	is the only	value of ${\cal T}$ th		uare numl					(1	
	Prove	In the formut (a) Kim s	Prove that $3c^2 + 15$ In the formula $T = (n$ (a) Kim says, "The value because $(n$ Comment on her	Prove that $\frac{6c^3 + 30c}{3c^2 + 15}$ is an even in the formula $T = (n - 6)^2 + 1$ in the formula $T = (n - 6)^2 + 1$ is always because $(n - 6)^2$ is always because $(n - 6)^2$ is always comment on her statement.	Prove that $\frac{6c^3 + 30c}{3c^2 + 15}$ is an even number. In the formula $T = (n - 6)^2 + 1$ n is a positive (a) Kim says, "The value of T is always greater because $(n - 6)^2$ is always greater Comment on her statement.	Prove that $\frac{6c^3 + 30c}{3c^2 + 15}$ is an even number. In the formula $T = (n - 6)^2 + 1$ n is a positive integer (a) Kim says, "The value of T is always greater than 1 because $(n - 6)^2$ is always greater than 0" Comment on her statement.	Prove that $\frac{6c^3 + 30c}{3c^2 + 15}$ is an even number. In the formula $T = (n - 6)^2 + 1$ n is a positive integer. (a) Kim says, "The value of T is always greater than 1 because $(n - 6)^2$ is always greater than 0" Comment on her statement.	Prove that $\frac{6c^3 + 30c}{3c^2 + 15}$ is an even number. In the formula $T = (n - 6)^2 + 1$ n is a positive integer. (a) Kim says, "The value of T is always greater than 1 because $(n - 6)^2$ is always greater than 0" Comment on her statement.	Prove that $\frac{6c^3 + 30c}{3c^2 + 15}$ is an even number. In the formula $T = (n - 6)^2 + 1$ n is a positive integer. (a) Kim says, "The value of T is always greater than 1 because $(n - 6)^2$ is always greater than 0" Comment on her statement.	Prove that $\frac{6c^3 + 30c}{3c^2 + 15}$ is an even number. (To	Prove that $3c^2 + 15$ is an even number. (Total 3 marks) In the formula $T = (n - 6)^2 + 1$ n is a positive integer. (a) Kim says, "The value of T is always greater than 1 because $(n - 6)^2$ is always greater than 0" Comment on her statement.

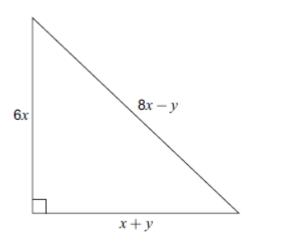
Q3.	$(2x + 3y)^2 - (2x - 3y)^2 = 360$	
	Show that xy is a multiple of 5	
		•
		(Total 4 marks)
		(Total 4 marks)
		(Total 4 marks)
Q4. P	Prove that $5x(x + 6) - (3x + 5)^2$ is negative for all values of x .	(Total 4 marks)
Q4 .P		(Total 4 marks)
Q4 .P		(Total 4 marks)
Q4. P		(Total 4 marks)
Q4. P	Prove that $5x(x + 6) - (3x + 5)^2$ is negative for all values of x .	(Total 4 marks)
Q4. P	Prove that $5x(x + 6) - (3x + 5)^2$ is negative for all values of x .	(Total 4 marks)
Q4 .P	Prove that $5x(x + 6) - (3x + 5)^2$ is negative for all values of x .	(Total 4 marks)
Q4. P	Prove that $5x(x + 6) - (3x + 5)^2$ is negative for all values of x .	(Total 4 marks)
Q4 .P	Prove that $5x(x + 6) - (3x + 5)^2$ is negative for all values of x .	(Total 4 marks)

(Total 4 marks)

Q5.			
QJ.	(a)	The <i>n</i> th term of a sequence is $n^2 + 12n + 27$	
		By factorising, or otherwise, show that the 20th term can be written as the product two prime numbers.	ct of
			(2)
	(b)	The <i>n</i> th term of a different sequence is $n^2 - 6n + 14$	
		By completing the square, or otherwise, show that every term is positive.	
		(Tota	(3) Il 5 marks)

Q6.

The diagram shows a right-angled triangle.



Not drawn accurately

Prove algebraically that	x: y = 2:3	
		Total 6 marks

Q7. Prove that
$$\frac{3n+5}{3n} - \frac{n}{n-1} \equiv \frac{2n-5}{3n(n-1)}$$

		(7)	Total 3 marks
Q8.			
	(a)	n is a positive integer.	
		Write down the next odd number after $2n - 1$	
		Answer	
			(1)
	(b)	Prove that the product of two consecutive odd numbers is always one less the multiple of 4.	nan a

(3) (Total 4 marks)

Q9. <i>n</i> is an integer	Q9.n	is	an	integer
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Show that $\frac{n(n-1)}{2} + \frac{n(n+1)}{2}$ is a square number.	
	(Total 3 marks)
Prove that $(5n + 3)(n - 1) + n(n + 2)$	
11000 that (011 1 0)(11 1) 1 11(11 1 2)	

Q10.

s a multiple of 3 for all integer values of n .	
	(Total 4 marks)

(Total 4 marks)

Q11. <i>n</i> is an integ	ger.
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$$S = \frac{1}{2}n(n+1)$$

		is an odd so						
						 	 (Total	5 marks)
Prove that	$\frac{3n-1}{n}$	$\frac{3n+1}{n-2}$	≡	$\frac{2-8n}{n(n-2)}$	-			

Q12. Prove that $\frac{3n-1}{n} - \frac{3n+1}{n-2} \equiv \frac{2-8n}{n(n-2)}$

Q13.

							(Total 4 marks)
						•••••	•
Prove algebraically					•	·	
·						•	J
A new sequence is	formed	by squa	aring eac	h term o	f the line	ear sequence and add	ling 1.
	2	7	12	17		is 5 <i>n</i> - 3	
The n^{th} term of the	linear se	equence					
	l:						