





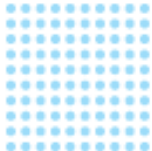




- 1) Complete the missing boxes in the table to identify the first ten square numbers. You might want to use counters to create each array on your table. The first one has been done for you.



$1 \times 1$	$1^2$	1					
	$2^2$				$7^2$		
$3 \times 3$				$8 \times 8$			
		16			$9^2$		
	$5^2$						

- 2) Why are these numbers called square numbers?
- 3) Look at the square numbers in the table.  
What patterns can you identify?



1) Jess says,

" $7^2$  is 14."

Do you agree?  
Explain your thinking.



2) True or False? Justify your answers and use examples.

- a) The square of even numbers is always even.
- b) All square numbers have an even number of factors.
- c) The product of two square numbers is a square number.

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1) The sum of two square numbers is 25.  
What are the square numbers?

2) The sum of three square numbers less than 144 is another square number.  
What are the square numbers?

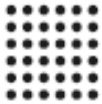

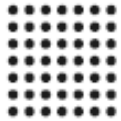

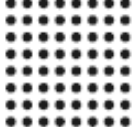

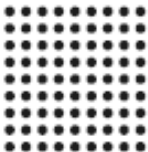

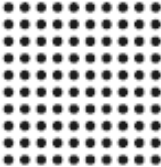
3) A, B and C are different square numbers less than 144. Can you find eight solutions to make this statement true?

$$A + B > B - C$$



# ANSWERS

1)

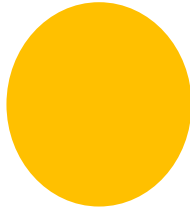
$1 \times 1$	$1^2$	1	•	$6 \times 6$	$6^2$	36	
$2 \times 2$	$2^2$	4		$7 \times 7$	$7^2$	49	
$3 \times 3$	$3^2$	9		$8 \times 8$	$8^2$	64	
$4 \times 4$	$4^2$	16		$9 \times 9$	$9^2$	81	
$5 \times 5$	$5^2$	25		$10 \times 10$	$10^2$	100	

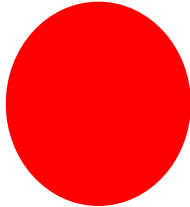


2) A square number is the product of a number and itself. The product can be shown as a square array hence the name.

3) The square numbers alternate between odd and even.

The difference between consecutive square numbers is odd and follows the pattern 3, 5, 7, 9, 11 and so on.

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- 1) Jess is incorrect.  $7^2$  is the same as  $7 \times 7$  which is 49. Jess has calculated  $7 \times 2$ .
  - 2) a) True. The product of two even numbers is always even.  
For example,  $4 \times 4 = 16$ ,  $6 \times 6 = 36$ .  
b) False. Square numbers have an odd number of factors as they are the result of the number being multiplied by itself. For example, the factors of 16 are 1, 2, 4, 8 and 16.  
c) True. For example,  $1 \times 4 = 4$ ,  $9 \times 4 = 36$ .

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- 1)  $9 + 16 = 25$  and  $36 + 64 = 100$
  - 2)  $4 + 9 + 36 = 49$  and  $1 + 16 + 64 = 81$
  - 3) There are many possible solutions, such as:  
 $1 + 16 > 16 - 9$   
 $1 + 16 > 16 - 4$   
 $1 + 25 > 25 - 16$   
 $1 + 25 > 25 - 9$   
 $1 + 25 > 25 - 4$   
 $16 + 4 > 4 - 1$   
 $25 + 81 > 81 - 64$   
 $36 + 49 > 49 - 16$