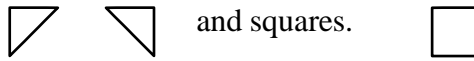


Name: _____ Date: _____

Patchwork

Kate makes patchwork cushions.
She uses right triangles

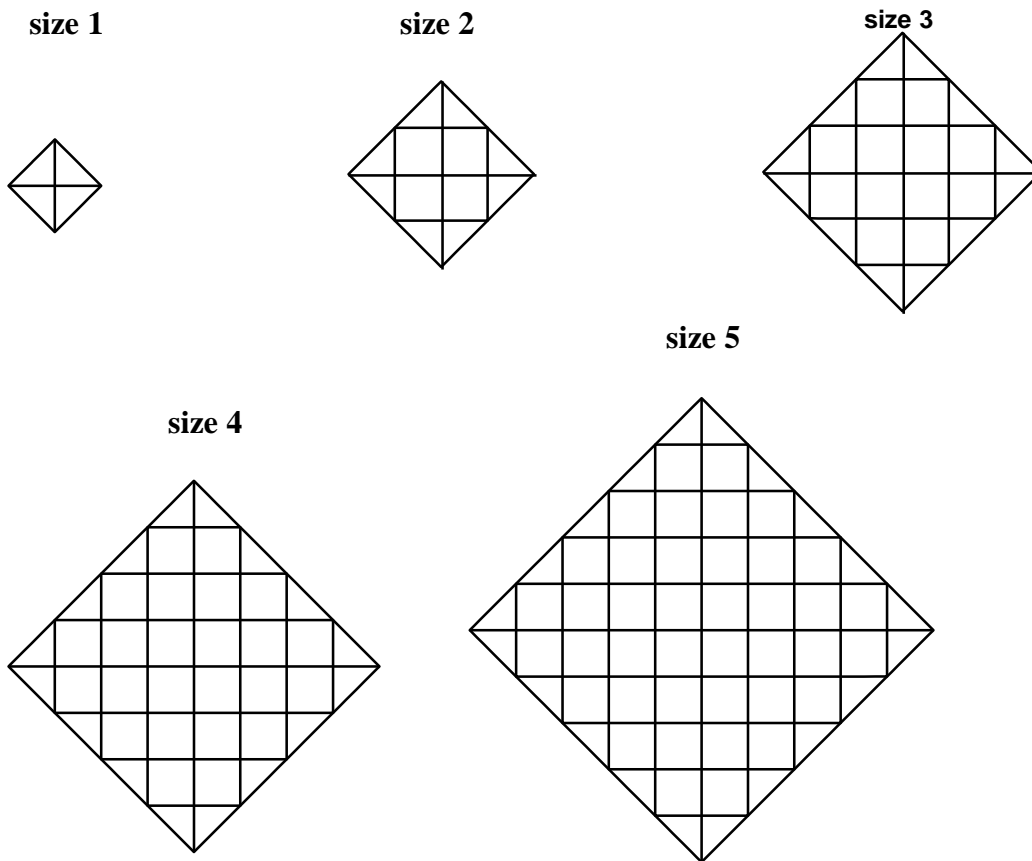


and squares.

She uses triangles along the edges of each cushion. The rest is made from squares.

The backs of the cushions are made of plain material, not patchwork.

Here are the first five sizes of patchwork cushions.



Kate makes cushions in many other different sizes.

She begins to figure out how many triangles and squares she needs for each size.

For size 1, she needs 4 triangles and 0 squares.

For size 2, she needs 8 triangles and 4 squares.

1. Complete this table to show how many triangles and squares she needs for each of these five sizes?

Size (n)	Number of triangles (t)	Number of squares (s)
1		
2		
3		
4		
5		

2. Find a rule, or a formula, that will help Kate figure out the number of triangles that she needs for cushions of different sizes. Explain how you figured it out.

3. Use the number patterns in the table to find a rule, or a formula, that will help Kate figure out the number of squares she needs for cushions of different sizes. Explain why your rule works.

4. Kate has a cushion made with 180 squares.
How many triangles are in this cushion?
Show how you found the number of triangles.

5. Kate wants to design another cushion made up of congruent right triangles. Size 1 will have 3 triangles. The next size up has 2 times as many as the size before it. Draw possible sketches of the first four sizes and write a rule, or formula, that describes the number of triangles she needs for different sizes.

Patchwork	Rubric																			
<p>The core elements of performance required by this task are:</p> <ul style="list-style-type: none"> • build a function that models a relationship between two quantities <p>Based on these, credit for specific aspects of performance should be assigned as follows</p>																				
<p>1. Gives correct answer:</p> <table border="1" data-bbox="370 598 1029 846"> <thead> <tr> <th>Size (n)</th> <th>Number of triangles (t)</th> <th>Number of squares (s)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>4</td> <td>0</td> </tr> <tr> <td>2</td> <td>8</td> <td>4</td> </tr> <tr> <td>3</td> <td>12</td> <td>12</td> </tr> <tr> <td>4</td> <td>16</td> <td>24</td> </tr> <tr> <td>5</td> <td>20</td> <td>40</td> </tr> </tbody> </table>	Size (n)	Number of triangles (t)	Number of squares (s)	1	4	0	2	8	4	3	12	12	4	16	24	5	20	40	2	2
Size (n)	Number of triangles (t)	Number of squares (s)																		
1	4	0																		
2	8	4																		
3	12	12																		
4	16	24																		
5	20	40																		
<p>2. Gives correct answer: $t = 4n$</p>	1	1																		
<p>3. Gives correct answer: $s = 2(n^2 - n)$ or equivalent equation</p>	2	2																		
<p>4. Gives correct answer: 40</p>	2	2																		
<p>5. Gives correct answer: Draws four correct figures.</p> <p>$y = 1.5(2)^x$</p>	2 1	3																		
Total Points		10																		