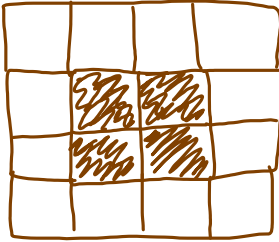
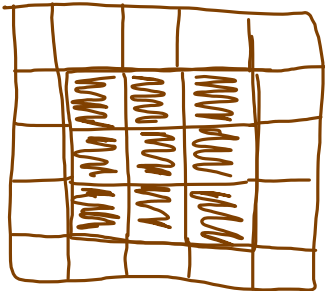


patio #1

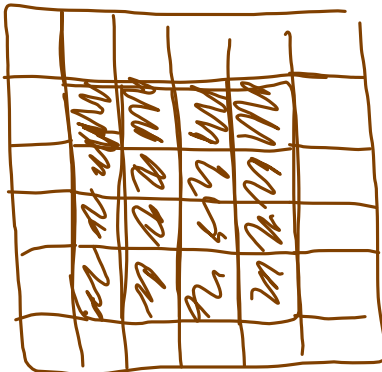
$$(patio\# \times 4) + 4 = \text{white tiles}$$



patio #2



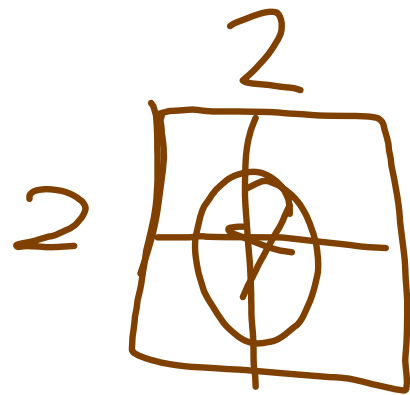
#3



#4

Square #

a # multiplied by
itself



Patio Number	# of Brown Tiles	# of White Tiles	Total # of Tiles
1	1	8	9
2	4	12	16
3	9	16	25
4	16	20	36
5	25		49
6	36		64
7	49		81
8	64		
n	n^2	$(n-4)+4$	$n^2 + 4n + 4$

The table shows a sequence of patio numbers from 1 to 8. The number of brown tiles increases by 4 each time (1, 4, 9, 16, 25, 36, 49, 64). The number of white tiles increases by 4 each time (8, 12, 16, 20, 24, 28, 32, 36). The total number of tiles is the sum of brown and white tiles, forming a sequence of squares (9, 16, 25, 36, 49, 64, 81, 100). The last three rows (5, 6, 7) are highlighted with a black box, and the total number of tiles for these rows (49, 64, 81) are marked with asterisks. The formula for the total number of tiles for patio number n is given as $n^2 + 4n + 4$.

patio #

$$5 + 2 = 7^2$$

$$6 + 2 = 8$$

$$7 + 2 = 9$$

8

n

total # of tiles

$$49 = n^2$$

.

$$\sqrt{64}$$

.

$$\sqrt{81}$$

.

$$n^2 + 4n + 4$$

$$(n+2)^2$$

$$9^2 + 4 \times 4$$

$$81 + 4 \times 4$$

$$81 + 16 = 97$$

$$(n+4) \times$$

$$n^{+4} \times +4$$

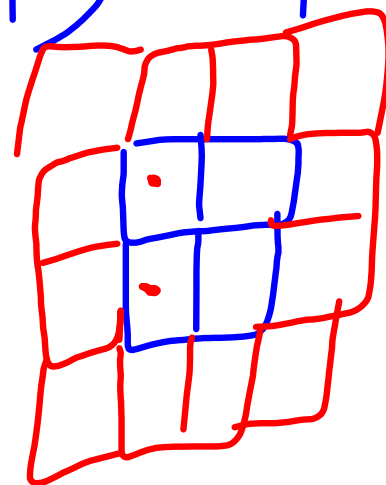
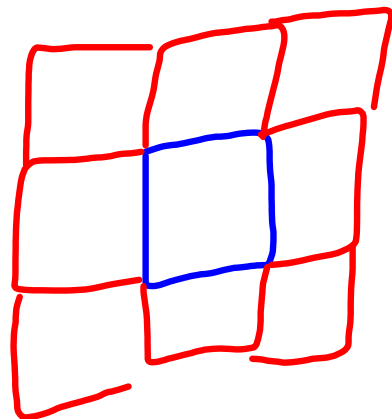
$$5^{+4} = 9 \Rightarrow 45 + 4 = 49$$

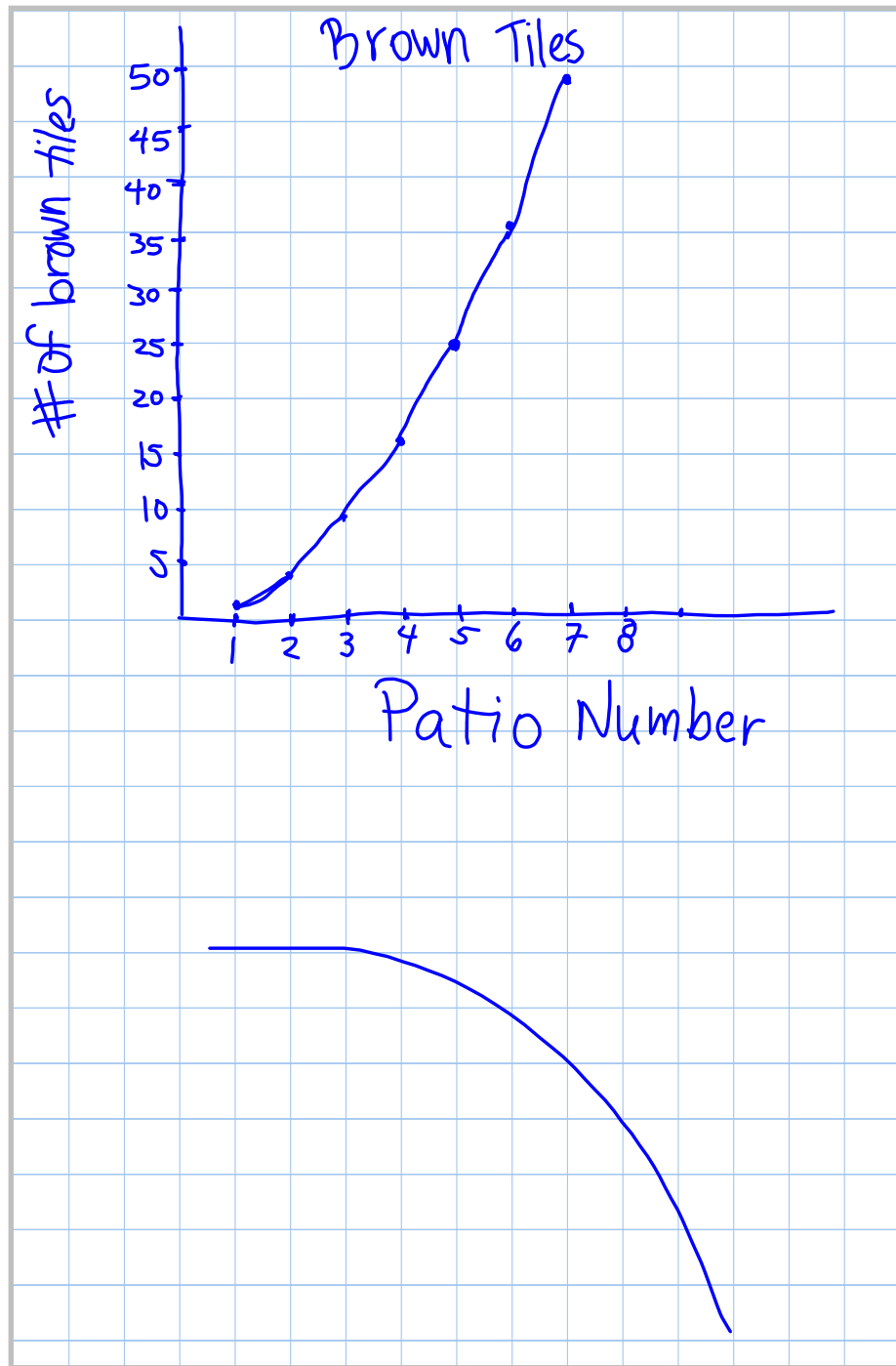
$$6^{+4} = 10 \Rightarrow 60 + 4 = 64$$

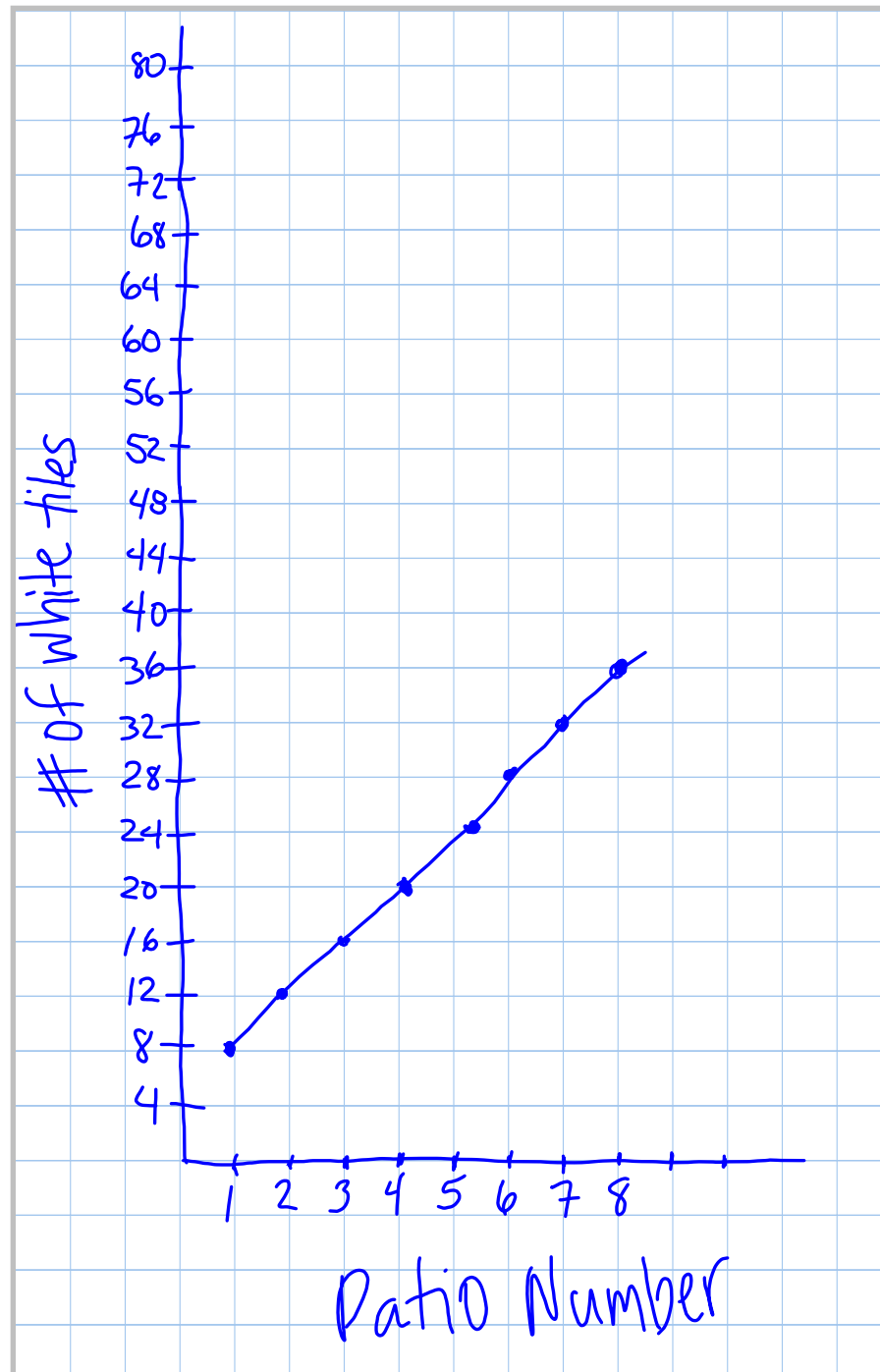
Determining # of white tiles

* increasing by 4

$$\left(\text{patio \#} \times 4 \right) + 4 = \text{\# white tiles}$$







Title: Grid - large (9 of 10)

How do you know your answers are correct.

Describe your methods for counting the different tiles.

What patterns do you see?

Can you come up with a rule for the number of tiles on the patio and the number on the border?

Test your rule with another example of a patio.

If there are thirty-six brown tiles, how many white tiles are there? Explain how you got there.

Can you make a square with forty-nine tiles? Explain why or why not.