Look over your patterns for 3.1

We will be moving on to lesson 3.2 after Mrs. Hansen takes attendance!

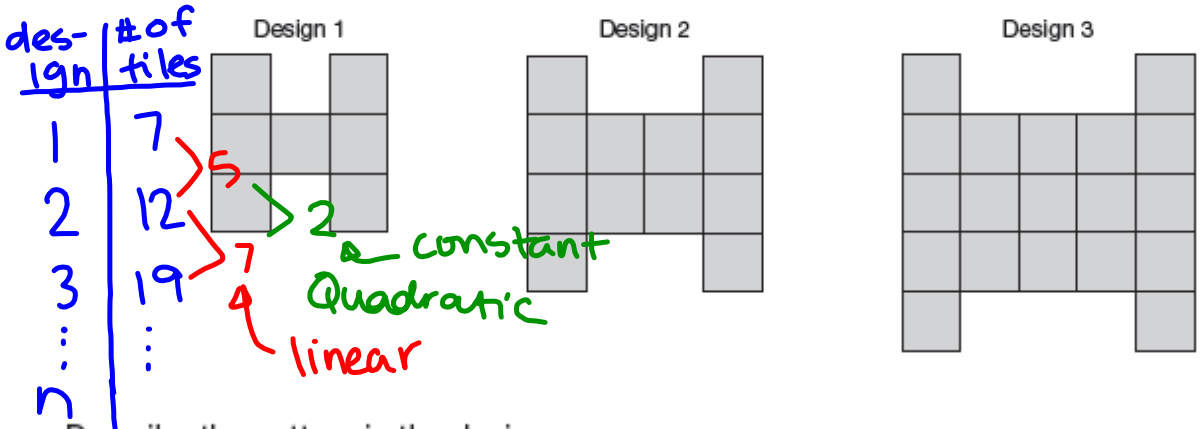
Are They Saying the Same Thing?

Using Patterns to Generate Algebraic Expressions

3.2

NOT IN YOUR BOOK

1. Hyatt Home Improvement uses H-shaped tile designs on their buildings, advertisements, and vehicles. The designs they use follow a specific pattern. The first three designs are shown.



design	# of tiles
1	7
2	12
3	19
⋮	⋮
n	

5, 7, 2 (constant), 4 (linear), Quadratic

a. Describe the pattern in the designs.

b. Write two different expressions to represent the number of tiles used in Design *n*. Use algebraic properties to prove the two expressions are equivalent.

① $(n^2)+[(n+2)\cdot 2]$

② n^2+2n+4

③ $n(n+2)+4$

All 3 simplify to the same expression

$a_n = a_{n-1}+2n+1$

c. Explain how you could use a graphing calculator to prove the two expressions in part (b) are equivalent.

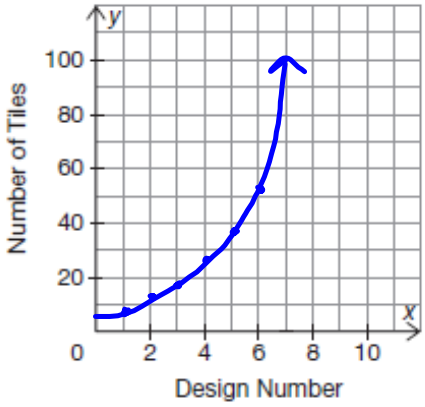
graph all of them & see if graph is the same.

NOT IN YOUR BOOK

d. Create a table which displays the number of tiles used in each of the first 6 designs.

design x	1	2	3	4	5	6
# of tiles	7	12	19	28	39	52

e. Create a graph of the data points in your table on the coordinate plane shown. Draw a smooth curve to connect the points.



f. Do all of the points on the smooth curve make sense in terms of the problem situation? Explain your reasoning.

No, we can't have fractional design #s.

g. Describe the pattern as linear, exponential, quadratic or none of these. Explain your reasoning.

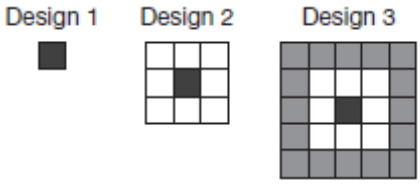
h. The owner of Hyatt Home Improvement wants to put 1 of their designs on an empty rectangular sign in front of their headquarters. The empty sign is 10 feet tall and 12 feet wide. If he uses square tiles measuring 1 foot by 1 foot, what is the number of the largest design that will fit on the sign? How many tiles will that design require?

dimensions are n+2, so 10x10 is design 8.

$8^2 + 2(8) + 4 = 84$ tiles

PG.118 IN YOUR BOOK

Terrance's flooring business from the problem, *There's More Than One Way to Tile a Floor*, was booming! He decides to hire several employees to help lay out his tile designs. It will be necessary for Terrance to describe his tile designs in a clear manner so that all of the employees can create them correctly. Recall that Terrance's square floor design uses alternating black, white, and gray tiles.



1. Describe the pattern in terms of the number of new tiles that must be added to each new square floor design.

2. Write an expression to represent the number of new tiles that must be added to an n by n square floor design. Let n represent the number of tiles along each edge of the square.

3. Describe which values for n make sense in this problem situation?

Oct 5-9:27 AM

PG.119 IN YOUR BOOK

4. Ramone determined an expression to represent this pattern. His expression and explanation are shown.

Ramone

Design	1	2	3
New Tiles	0	8	16

The expression $8(n - 1)$ represents Terrance's square floor pattern. I noticed that the number of new tiles is increasing by 8 in each new design.

Explain why Ramone's expression is incorrect.

5. Describe the pattern as new tiles are added as linear, quadratic, exponential, or none of these. Explain your reasoning.

Homework

Finish lesson 3.2

Aug 24-2:00 PM