## Unit 6 Lesson 4: Comparing Quadratic and Exponential Functions

### 1 From Least to Greatest (Warm up)

#### Student Task Statement

List these quantities in order, from least to greatest, without evaluating each expression. Be prepared to explain your reasoning.

A.

B.

C.

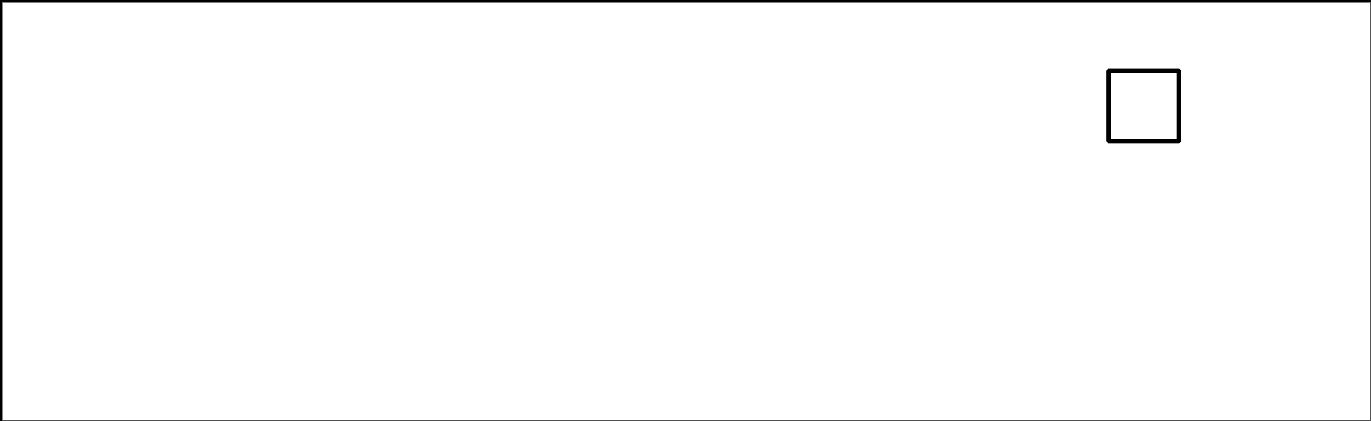
D.

### 2 Which One Grows Faster?

#### Student Task Statement

* In Pattern A, the length and width of the rectangle grow by one small square from each step to the next.
* In Pattern B, the number of small squares doubles from each step to the next.
* In each pattern, the number of small squares is a function of the step number, .

Pattern A



Pattern B



1. Write an equation to represent the number of small squares at Step in Pattern A.
2. Is the function linear, quadratic, or exponential?
3. Complete the table:

|  |  |
| --- | --- |
| * , step number | * , number of small squares |
| * 0 |  |
| * 1 |  |
| * 2 |  |
| * 3 |  |
| * 4 |  |
| * 5 |  |
| * 6 |  |
| * 7 |  |
| * 8 |  |

1. Write an equation to represent the number of small squares at Step in Pattern B.
2. Is the function linear, quadratic, or exponential?
3. Complete the table:

|  |  |
| --- | --- |
| * , step number | * , number of small squares |
| * 0 |  |
| * 1 |  |
| * 2 |  |
| * 3 |  |
| * 4 |  |
| * 5 |  |
| * 6 |  |
| * 7 |  |
| * 8 |  |

How would the two patterns compare if they continue to grow? Make 1–2 observations.

#### Activity Synthesis



### 3 Comparing Two More Functions

#### Student Task Statement

Here are two functions: and .

Investigate the output of and for different values of . For large enough values of , one function will have a greater value than the other. Which function will have a greater value as increases?

Support your answer with tables, graphs, or other representations.



© CC BY 2019 by Illustrative Mathematics®