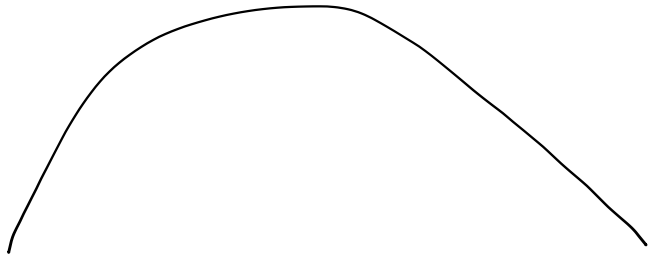
Exploring Quadratic Relations

Learning Goal

- Determine the properties of quadratic relations.

Minds on …

- Math Cheerleading Team!
  - With your partner, complete the activity to begin our exploration into quadratic relations.



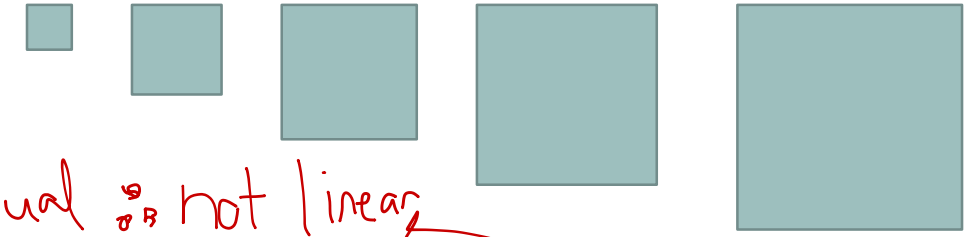
Big Ideas

- A quadratic relation's:
  - GRAPH
    - Is a symmetric curve called a parabola.
    - It has a u-shape that either opens up or down.

  - EQUATION
    - One form is called standard form $y = ax^2 + bx + c$, it has a degree of 2.
    - The "a" gives the direction of the parabola.
    - The "b" changes the line of symmetry.
    - The "c" is the y-intercept.

Example #1

The first five figures in a pattern are shown.

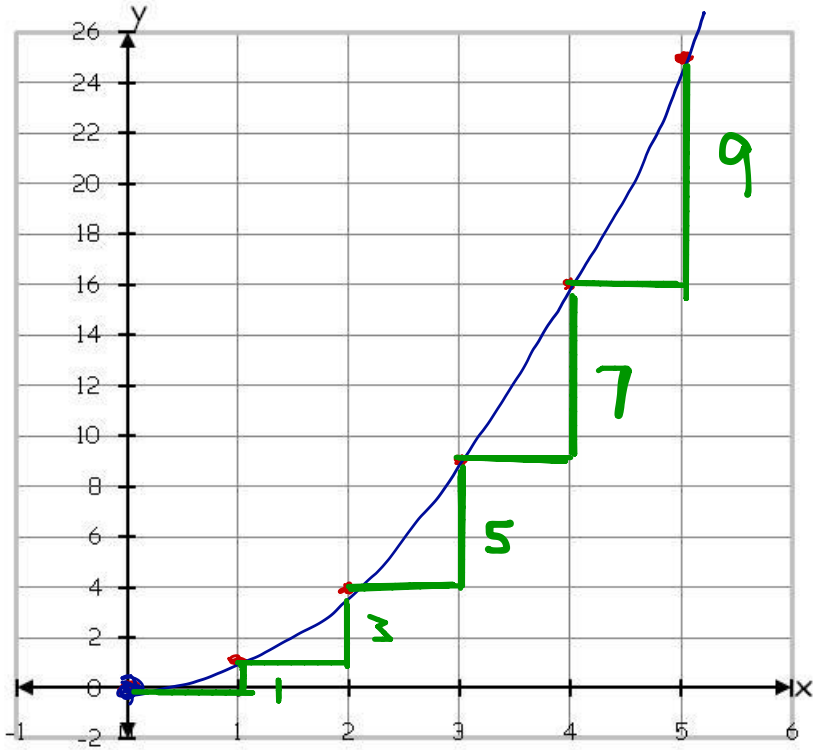


Not equal ∴ not linear

Side Length (units)	Area (square units)	1st Diff.	2nd Differences
1	1	4 - 1 = 3	5 - 3 = 2
2	4	9 - 4 = 5	7 - 5 = 2
3	9	16 - 9 = 7	9 - 7 = 2
4	16	25 - 16 = 9	
5	25		

all equal
∴ Quadratic

Example #1 (continued)



Area (units^2)

Step - Pattern 1, 3, 5, 7, 9

side length (units)

Big Ideas (continued)

- A quadratic relation's:
  - TABLE OF VALUES
    - The second differences are constant.
    - If the constant is positive, the parabola opens up.
    - If the constant is negative, the parabola opens down.

Consolidation

Where can you see parabolas?

Architecture





Nature






Science






Reinforcement

- Pages 136 – 137
  - #1 – 7