## Unit 6 Lesson 17: Parameters and Graphs

### 1 Which One Doesn’t Belong: Triangles (Warm up)

#### Student Task Statement

Each figure shows triangle $PQR$, and its image after a transformation, $P^{′}Q^{′}R^{′}$. Which one doesn’t belong?

A



B



C



D



### 2 Describe the Change

#### Student Task Statement

1. Use graphing technology to graph each equation. Describe how each graph changes from the previous graph and draw a sketch of the change.

| * equation
 | * description of change
 | * sketch of graph
 |
| --- | --- | --- |
| * $y=x^{2}$
 | * original graph
 | * Parabola in the x y plane.
 |
| * $y=\left(x−5\right)^{2}$
 | *
 | * Parabola in the x y plane.
 |
| * $y=\left(x−5\right)^{2}+4$
 | *
 | * Parabola in the x y plane.
 |

1. Describe the change in the given sketch and write an equation that you think would generate that change.

| * equation
 | * description of change
 | * sketch of graph
 |
| --- | --- | --- |
| * $y=x^{2}$
 | * original graph
 | * Parabola in the x y plane.
 |
| *
 | *
 | * Two parabolas in the x y plane.
 |
| *
 | *
 | * Three parabolas in the x y plane.
 |

1. How would the graph of $y=-2x^{2}−3$ compare to the graph of $y=2x^{2}−3$?

### 3 Select a Function

#### Student Task Statement

Let’s call the graph of $y=x^{2}$ “the original graph.”

Select the function that will affect the original graph in the way described.

1. Shift the vertex of the graph left 1 unit.
2. Shift the vertex of the graph up 1 unit.
3. Shift the vertex of the graph right 1 unit and up 1 unit.
4. Make the original graph narrower.
5. Make the original graph narrower, and shift the vertex 1 unit to the right.
* $y=x^{2}+1$
* $y=\left(x+1\right)^{2}$
* $y=3x^{2}$
* $y=\left(x−1\right)^{2}+1$
* $y=3\left(x−1\right)^{2}$



© CC BY 2019 by Illustrative Mathematics®