Odd One Out—Quadratic Functions

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| **Quadratic Function 1** | **Which one is the Odd One Out?**  | **Why is it the Odd One Out?** |
|  | * The roots of this equation are $\left(0, -4\right)$ and $(5, 0)$.
* The vertex of this quadratic function is $(2, -8)$.
* This graph has a y-intercept at $\left(0, -4\right)$.
* The range of this graph is $y\geq -8$.
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| **Quadratic Function 2** | **Which one is the Odd One Out?** | **Why is it the Odd One Out?** |
|  | * The graph has a y-intercept at $(0, 3)$ .
* The graph has a vertex at $(-1, 1)$.
* The graph has a maximum value at $(-1, 1)$.
* The graph has a line of symmetry of$ x=-1$.
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| **Quadratic Function 3** | **Which one is the Odd One Out?** | **Why is it the Odd One Out?** |
| The factored form of a quadratic function is : $$y=\left(x-4\right)(2x-3)$$ |  * The graph has a y-intercept at $(0, 12)$.
* The domain of the function is all real numbers.
* The vertex of the graph is $(3, -4)$.
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| **Quadratic Function(s) 4** | **Which one is the Odd One Out?** | **Why is it the Odd One Out?** |
| Look at the equations below for two quadratic functions. **Equation 1:** $y=3(x-5)^{2}+1$ **Equation 2:** $y=3(x+5)^{2}+1$ | * Equation 1 is a reflection of Equation 2 over the y- axis.
* Both equations have minimum points that fall on the line $y=1$.
* Both graphs are shifted to the right 5 units from the parent function.
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| **Quadratic Function 5** | **Which one is the Odd One Out?** | **Why is it the Odd One Out?** |
|  | * The graph has a y-axis line of symmetry.
* There are no real solutions to this function.
* The range of the function is $y\leq -1$.
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| **Quadratic Function 6** | **Which one is the Odd One Out?** | **Why is it the Odd One Out?** |
| The equation for a quadratic function is shown below: $$6x^{2}+9x-6=0$$ | * This function has x-intercepts at $(-2,0)$ and $(\frac{1}{2},0)$.
* This function has a

 y-intercept of $(0, -8)$.* This function has no maximum value.
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**Answers:**

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| **Graphic** | **Answer:** |
| **1** | The roots of this equation are $\left(0, -4\right)$ and $(5, 0)$.  |
| **2** | The graph has a maximum value at $(-1, 1)$. |
| **3** | The vertex of the graph is $(3, -4)$. |
| **4** | Both graphs are shifted to the right 5 units from the parent function.  |
| **5** | The graph has a y-axis line of symmetry.  |
| **6** | This function has a y-intercept of $(0, -8)$. |

**Teacher Directions for Use:**

* Go over the Odd One Out Concept Review activity to review the key characteristics of a quadratic graph. This document has two copies of the same problem(cut in half prior to use)
* Explain the directions for Odd One Out: (Students will identify the false statement and justify their answer). Provide students with the graph paper below and a calculator.
* Ask students to try the first problem. Once they have selected the false statement and justified it on their paper, tell them to compare with their shoulder partner and come to agreement/consensus on their answer. (Solo—Pair—Consensus) Follow this model until students have completed all 6 questions. Then, discuss the questions as a group.
* Remind students that they may see questions that say : Which is NOT a characteristic of a quadratic function? Odd One Out prepares them for this type of thinking.

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