Quadratic Relations: Vertex to Standard Form

***Review***

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***Therefore***

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***DISCOVERY***

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| Sketch the following equation: | Use a table of values to sketch |
| basic plane | |  |  |  | | --- | --- | --- | | ***x*** |  | **(*x*, *y*)** | | -1 |  |  | | 0 |  |  | | 1 |  |  | | 2 |  |  | | 3 |  |  | | 4 |  |  |   basic plane |

What do you notice about the two graphs?

Recall Expanding

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| 1. -3 (2x +3) | 1. (x – 2)2 | 1. -2 (x + 3)2 |

Writethe Quadratic Relation in Standard Form

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| 1. y = (x + 6)2 | 1. y = -2 (x – 7)2 | 1. y = 3(x – 5)2 – 8 |

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| **Vertex Form** | **Vertex** | **Standard Form** | **y-intercept** | **Same Parabola? (yes/no)** |
| y = a(x – h)2 + k  y = (x + 2)2 – 5 | (h, k) | y = (x + 2)2 – 5 | The value of ‘c’ in Standard Form |  |

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| **Key Concepts**   * A quadratic relation can be written in v\_\_\_\_\_\_\_\_\_\_\_\_ f\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or in s\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ f\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. * E\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and s\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the v\_\_\_\_\_\_\_\_\_\_\_\_\_ f\_\_\_\_\_\_\_\_\_\_\_\_ to write the quadratic relation in s\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ f\_\_\_\_\_\_\_\_\_\_\_\_. * Given the quadratic relation in vertex form, , the coordinates of the vertex are \_\_\_\_\_\_\_\_\_\_\_\_. * Given a quadratic relation in standard form, , the \_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_ is \_\_\_\_. |

**Vertex to Standard Form of a Quadratic Relation – Assignment**

For each of the following parabolas:

1. State the vertex of the parabola
2. Expand the equation to standard form.
3. Using a graphing calculator graph each equation (the vertex form and the standard form).   
   If you have expanded the equation properly you should see the second parabola being graphed on top of the first parabola.
4. If you see two parabolas… go back and check your algebra!

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| **Vertex Form** | **Vertex** | **Standard Form** | **y-intercept** | **Same Parabola? (yes/no)** |
| **y = a(x – h)2 + k**  **y = 2(x + 2)2 – 5** | **(h, k)**  **(-2, -5)** | **= 2(x+2)(x+2) – 5**  **= 2(x2 +2x +2x +4) – 5**  **= 2(x2 +4x + 4) – 5**  **= 2x2+8x +8 – 5**  **= 2x2 +8x + 3 🡨 y = ax2 +bx +c** | **(0, c)**  **(0, 3)** | **Yes** |
| **y = (x – 7)2 – 4** |  |  |  |  |
| **y = - (x + 1)2 – 3** |  |  |  |  |
| **y = - (x – 3)2 + 4** |  |  |  |  |
| **Vertex Form** | **Vertex** | **Standard Form** | **y-intercept** | **Same Parabola? (yes/no)** |
| **y = 2(x – 3)2 + 1** |  |  |  |  |
| **y = 4(x + 1)2 – 6** |  |  |  |  |
| **y =(x + 1)2 – 9** |  |  |  |  |
| **y = - (x – 3)2** |  |  |  |  |
| **y = -3(x + 5)2 + 3** |  |  |  |  |