

Transformations of Parabolas Guided Notes

1. The graph of $f(x) = a(x-h)^2 + k$, where $a \neq 0$, is a _____ of _____ form:
With (-----,-----) as a vertex.
2. If $a > 0$, then the graph of the parabola is vertically _____.
3. If _____ $< a <$ _____, then the graph of the parabola is vertically _____.
4. If $a < 0$ then the graph does a _____ across the x-axis.
5. The axis of symmetry of a parabola in vertex form is the line $x =$ _____.
6. The _____ of a parabola is the point (h, k) .
7. Write the standard form $y = 2x^2 - 4x + 5$ in vertex form:

$$y - \underline{\hspace{2cm}} = 2x^2 - 4x \quad \text{keep } x^2 \text{ and } x\text{-terms in one side.}$$

$$y - \underline{\hspace{2cm}} = (\underline{\hspace{1cm}})(x^2 - (\underline{\hspace{1cm}})(x)) \quad \begin{array}{l} \text{factor out the leading coefficient since} \\ \text{we want 1 as leading coefficient.} \end{array}$$

$$y - 5 + 2(\underline{\hspace{2cm}}) = 2(x^2 - 2x + \underline{\hspace{2cm}}) \quad \begin{array}{l} \text{put the coefficient of } x \text{ term in half and} \\ \text{square it inside the parenthesis. The same product} \\ \text{should also appear in left hand side.} \end{array}$$

$$y - \underline{\hspace{2cm}} = 2(x - \underline{\hspace{2cm}})^2 \quad \text{find the perfect square and simplify.}$$

$$y = 2(x - \underline{\hspace{2cm}})^2 + \underline{\hspace{2cm}} \quad \text{Write in vertex form}$$