Maximums and Minimums of Quadratic Functions

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The vertex (h, k) is the extreme point of the graph:

$$y = ax^2 + bx + c$$

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Recall: The vertex (h, k) is the extreme point of the graph:

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We found a shortcut to writing this in vertex form:

$$y = a(x - h)^2 + k$$
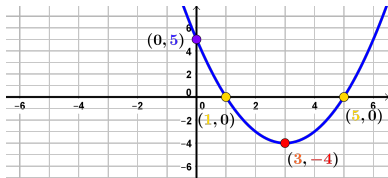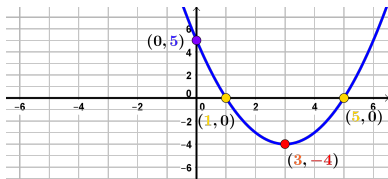
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Examples where
the vertex is a *minimum*

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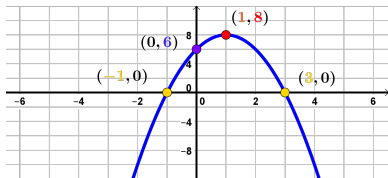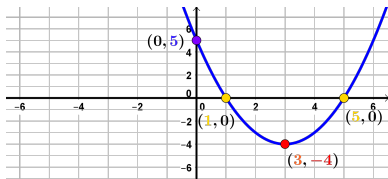▸ Recall: The vertex (h, k) is the extreme point of the graph:

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How can we tell if the vertex is the minimum (k is the lowest $y-$value)

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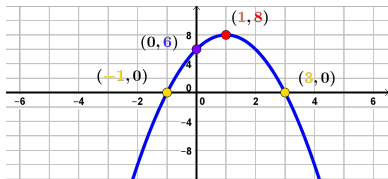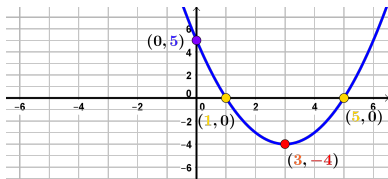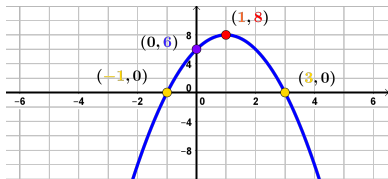
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How can we tell if the vertex is the minimum (k is the lowest $y-$value)
Or the vertex is the maximum (k is the highest $y-$value)?

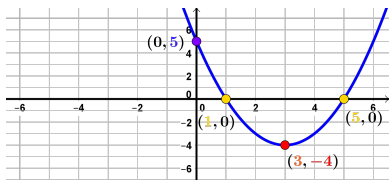# Maximums and Minimums of Quadratic Functions

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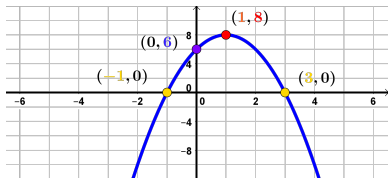
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▸ We saw: that a will reflect the basic graph of $y = x^2$ across the $x-$axis
if $a < 0$

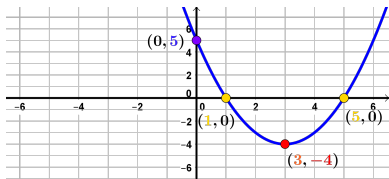# Maximums and Minimums of Quadratic Functions

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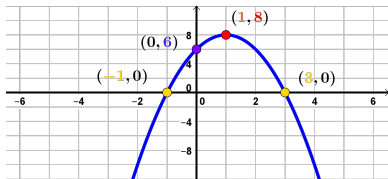
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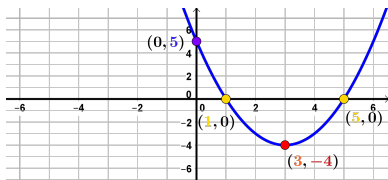# Maximums and Minimums of Quadratic Functions

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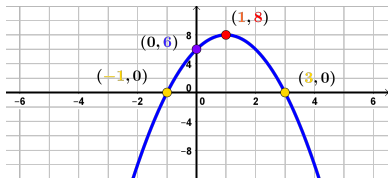
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▸ We have seen Examples where the vertex is a *minimum*

$(0, 5)$, $(1, 0)$, $(5, 0)$, $(3, -4)$

▸ And Examples where the vertex is a *maximum*

$(1, 8)$, $(0, 6)$, $(-1, 0)$, $(3, 0)$

How can we tell if the vertex is the minimum (k is the lowest $y-$value)
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if $a < 0$ $\Leftrightarrow$ the vertex is a *maximum*
if $a > 0$ $\Leftrightarrow$ the vertex is a *minimum*