Precalculus
Compute parabola with given vertex and passing through a point

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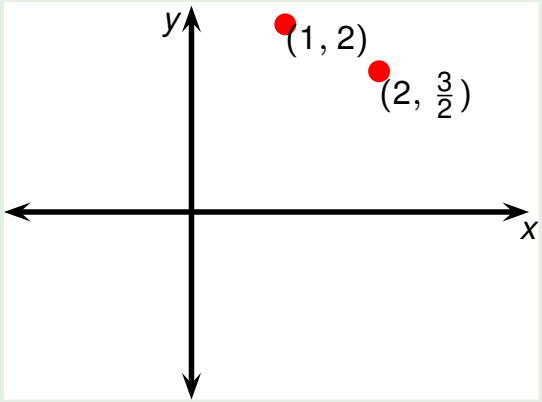
2019

Example



Write an equation of a parabola with vertex at $(1, 2)$ that passes through the point $\left(2, \frac{3}{2}\right)$.

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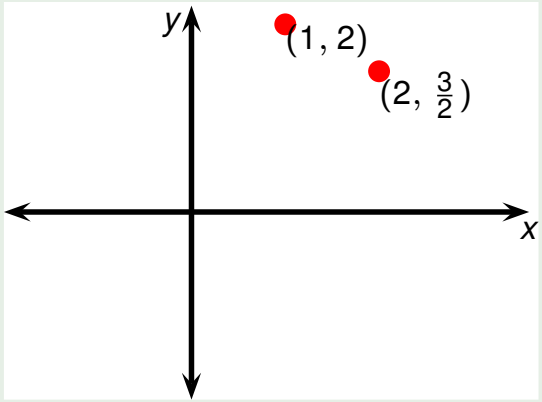

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$$a(x-h)^2+k = y \quad \Big| \quad \text{Standard form}$$

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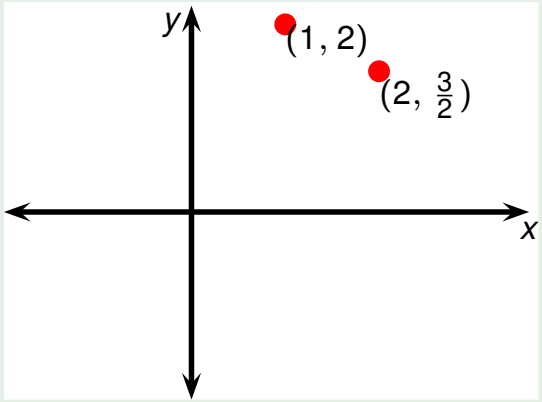

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$$a(x - \textbf{?})^2 + \textbf{?} = y$$

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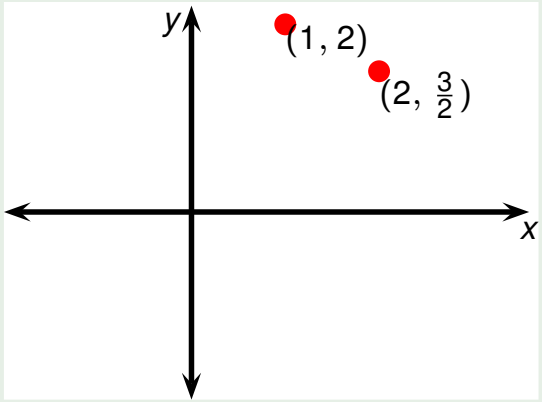

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$a(x-h)^2+k$	$=$	y	Standard form
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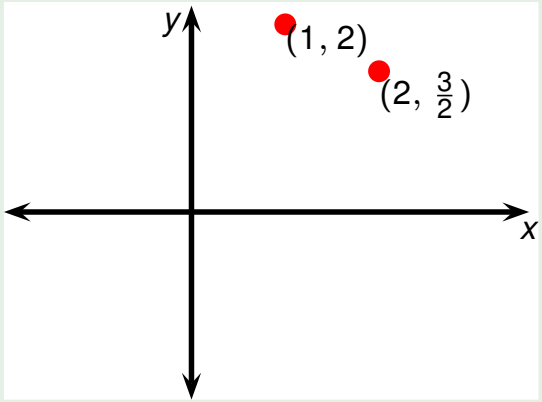

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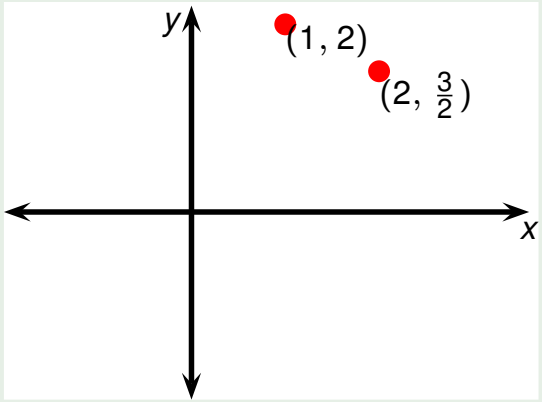

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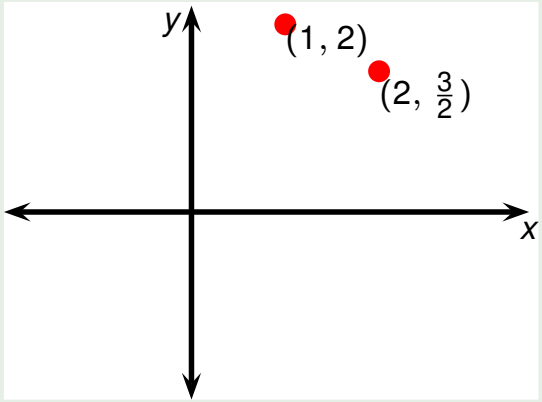

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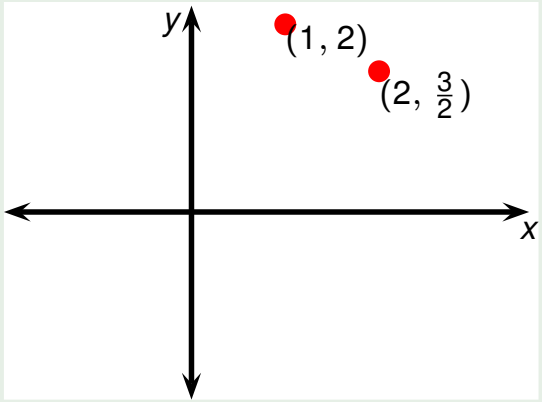

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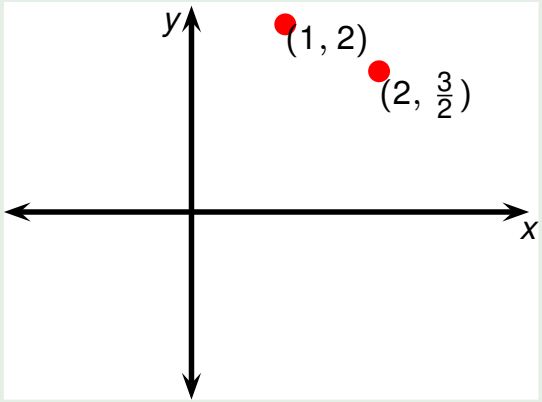

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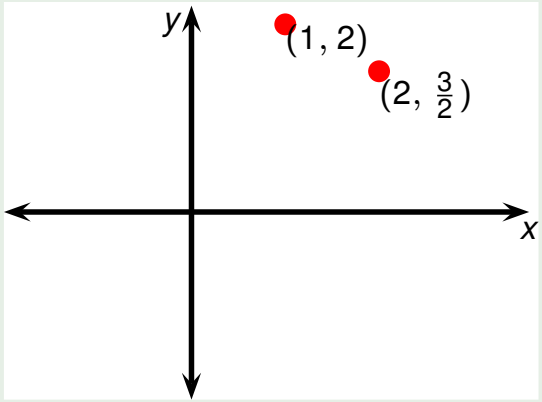

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a &= \frac{3}{2}-2
\end{aligned}
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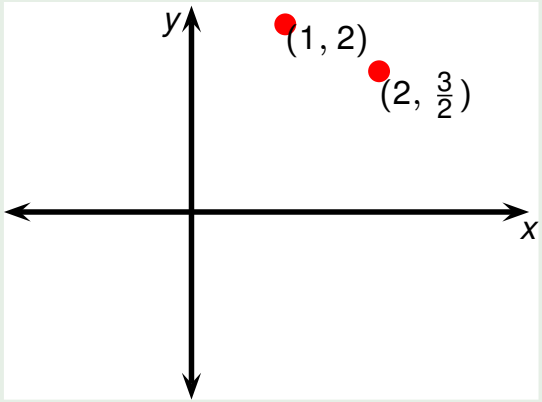

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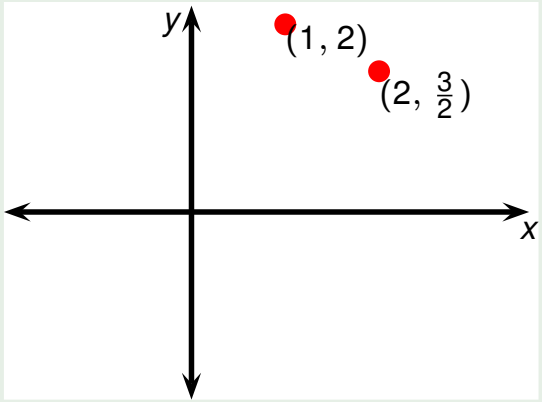

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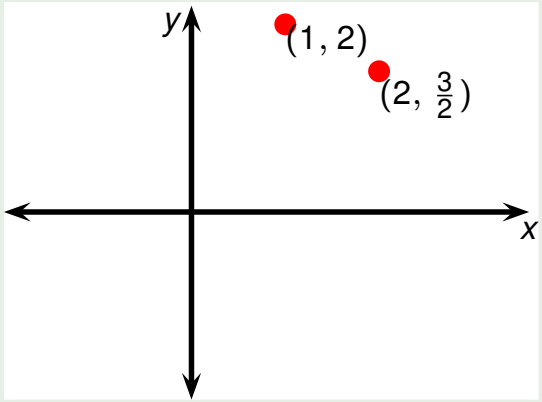

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y &= -\frac{1}{2}(x-1)^2+2 && \text{Final answer}
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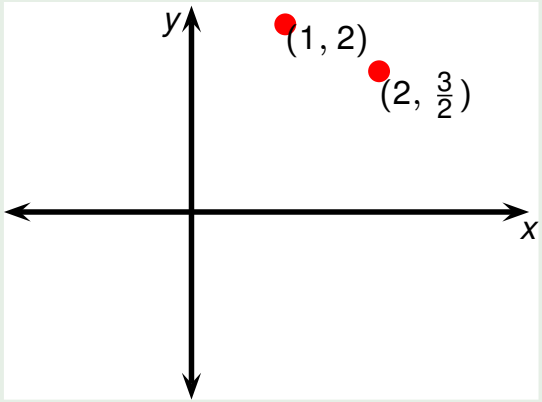

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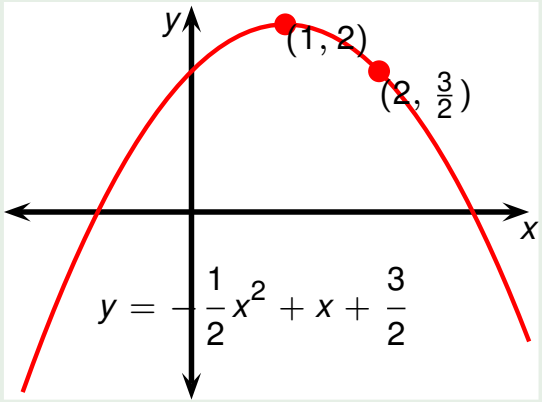

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y & = & -\frac{1}{2}(x-1)^2+2 & \text{Final answer} \\
y & = & -\frac{1}{2}x^2+x+\frac{3}{2} & \text{Alternative answer}
\end{array}
$$