

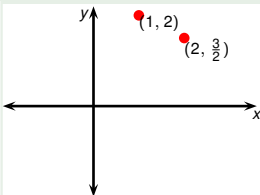
Precalculus

Compute parabola with given vertex and passing through a point

Todor Milev

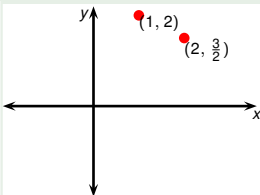
2019

Example



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

Example

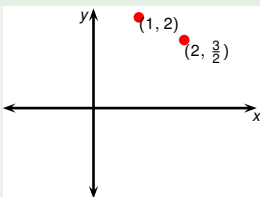


Write an equation of a parabola with vertex at $(1, 2)$ that passes through the point $(2, \frac{3}{2})$.

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

Standard form

Example



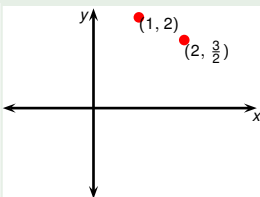
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$$a(x - h)^2 + k = y$$

Standard form

$$a(x - ?)^2 + ? = y$$

Example



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

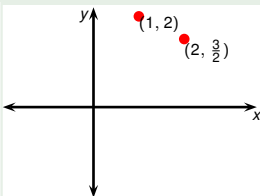
$$a(x - h)^2 + k = y$$

$$a(x - 1)^2 + 2 = y$$

Standard form

Vertex at (1, 2)

Example



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

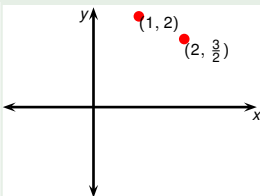
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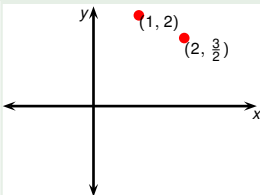
$$a(x - h)^2 + k = y$$

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Standard form

Vertex at $(1, 2)$

Example



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

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

$$a(x - 1)^2 + 2 = y$$

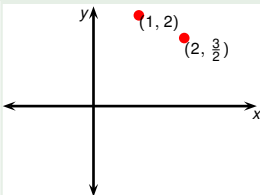
$$a(\mathbf{2} - 1)^2 + 2 = \mathbf{\frac{3}{2}}$$

Standard form

Vertex at (1, 2)

Passes through $(2, \frac{2}{3})$

Example



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

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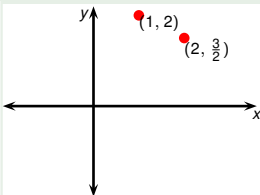
$$a(2 - 1)^2 + 2 = \frac{3}{2}$$

Standard form

Vertex at (1, 2)

Passes through $(2, \frac{3}{2})$

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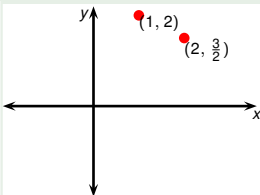
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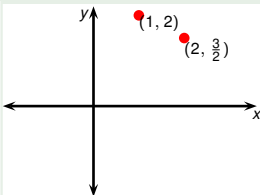
$$a = \frac{3}{2} - 2$$

Standard form

Vertex at $(1, 2)$

Passes through $(2, \frac{2}{3})$

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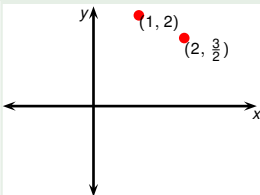
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Standard form

Vertex at $(1, 2)$

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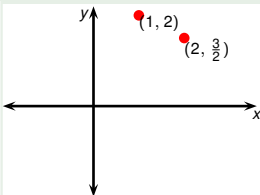
$$a = \frac{3}{2} - 2 = -\frac{1}{2}$$

Standard form

Vertex at $(1, 2)$

Passes through $(2, \frac{2}{3})$

Example



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

Standard form

$$a(x - 1)^2 + 2 = y$$

Vertex at $(1, 2)$

$$a(2 - 1)^2 + 2 = \frac{3}{2}$$

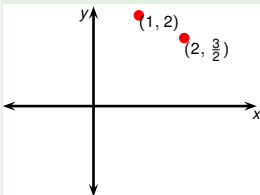
Passes through $(2, \frac{2}{3})$

$$a = \frac{3}{2} - 2 = -\frac{1}{2}$$

$$y = -\frac{1}{2}(x - 1)^2 + 2$$

Final answer

Example



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

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

$$a(x - 1)^2 + 2 = y$$

$$a(2 - 1)^2 + 2 = \frac{3}{2}$$

$$a = \frac{\frac{3}{2}}{1} - 2 = -\frac{1}{2}$$

$$y = -\frac{1}{2}(x - 1)^2 + 2$$

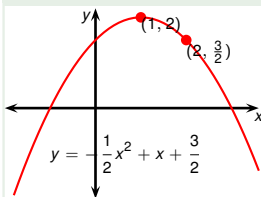
Standard form

Vertex at (1, 2)

Passes through $(2, \frac{2}{3})$

Final answer

Example



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

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

$$a(x - 1)^2 + 2 = y$$

$$a(2 - 1)^2 + 2 = \frac{3}{2}$$

$$a = \frac{3}{2} - 2 = -\frac{1}{2}$$

$$y = -\frac{1}{2}(x - 1)^2 + 2$$

$$y = -\frac{1}{2}x^2 + x + \frac{3}{2}$$

Standard form

Vertex at $(1, 2)$

Passes through $(2, \frac{3}{2})$

Final answer

Alternative answer