

Section 11.1

Parabolas

In this lesson, we will find equations of parabolas with some given conditions.

Find an equation of the parabola that satisfies the given conditions. Hint: Sketches are always helpful.

Ex 1) Vertex $V(1, 2)$
Opening Down
Passing through the point $P(3, -1)$

Ex 2) Vertex $V(3, 2)$
Opening Left
Passing through the point $(0, 5)$

Opening down means this is a vertical parabola (the x is the squared variable). We know values for h , k , x , and y . We need to solve for p , which we know should be negative.

Ex 3) Focus $F(3, 0)$
Directrix $x = -1$

Ex 4) Focus $F(0, -6)$
Directrix $y = 2$

Remember, the distance between the focus and the directrix is $2p$.

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Ex 5) Vertex $V(-3, 2)$
Directrix $x = 3$

Ex 6) Vertex $V(-1, -3)$
Focus $F(-1, 2)$

Distance
between the
vertex and
directrix is p .
A sketch will
make clear the
direction of
opening.

Ex 6) Vertex at the origin
Symmetric to the y -axis
Passing through the point $P(6, 3)$

Ex 7) Vertex $(3, -2)$
Axis parallel to the x -axis
 y -intercept 1

Basic form of
equation is
 $x^2 = 4py$