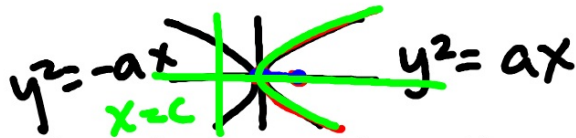
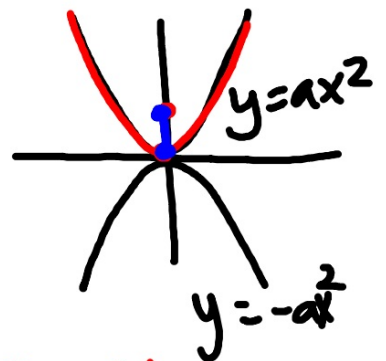


Precalc 10.5



Use and determine standard and general forms of the equation of a parabola

Graph parabolas

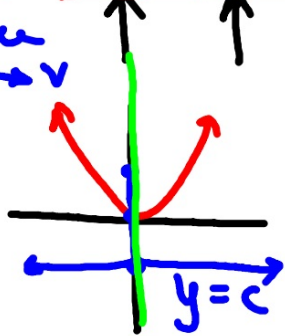


$$e = \frac{c}{a}$$

parent graph $y=x^2$

$x^2=y$ $y^2=x$

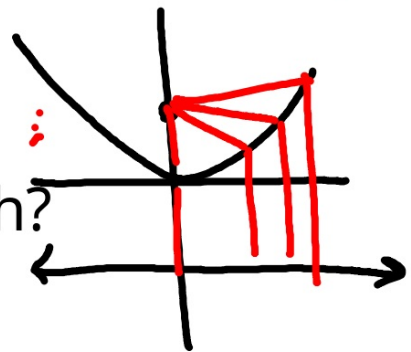
- p = distance $f \rightarrow v$
- focus
- directrix = line
- axis of symmetry
- vertex
- latus rectum



ellipse $e < 1$
 hyperbola $e > 1$
 parabola $e = 1$

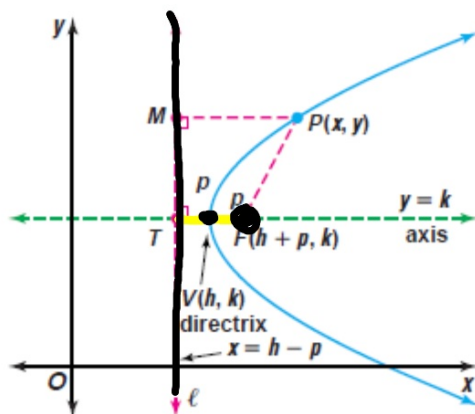
eccentricity

light bulbs parabolic reflector



<https://www.youtube.com/watch?v=Vq7xXUaCDI4>

p (parabola constant)



$x^2 = 4py$ or $y^2 = 4px$

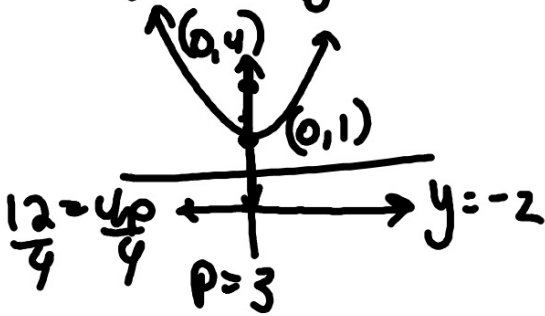
For the equation of each parabola, find the coordinates of the vertex and focus, and the equations of the directrix and axis of symmetry. Then graph the equation.

6. $x^2 = 12(y - 1)$

7. $y^2 - 4x + 2y + 5 = 0$

8. $x^2 + 8x + 4y + 8 = 0$

$(x - 0)^2 = (y - 1)$



Standard form or...

Complete the square...

$x =$

$y =$

**General Form
for the
Equation of
a Parabola**

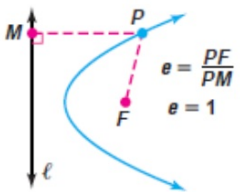
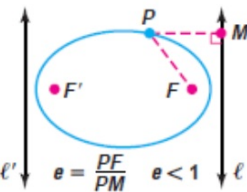
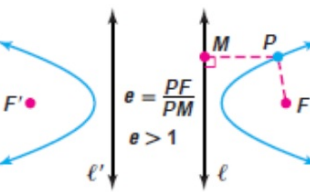
The general form of the equation of a parabola is
 $y^2 + Dx + Ey + F = 0$, when the directrix is parallel to the y -axis, or
 $x^2 + Dx + Ey + F = 0$, when the directrix is parallel to the x -axis.

18. $x^2 + 10x + 25 = -8y + 24$

3 Consider the equation $2x^2 - 8x + y + 6 = 0$.

- a. Write the equation in standard form.
- b. Find the coordinates of the vertex and focus and the equations for the directrix and the axis of symmetry.
- c. Graph the equation of the parabola.

factor
complete the square
solve for $x^2=4py$

parabola	ellipse	hyperbola
$e = 1$	$e < 1, e \neq 0$	$e > 1$
 <p> $e = \frac{PF}{PM}$ $e = 1$ </p>	 <p> $e = \frac{PF}{PM}$ $e < 1$ </p>	 <p> $e = \frac{PF}{PM}$ $e > 1$ </p>

Write the equation of the parabola that meets each set of conditions. Then graph the equation.

9. The vertex is at the origin, and the focus is at $(0, -4)$.

If you can determine p , the problem will unravel from there.

p =distance:
vertex to focus=vertex to directrix

hint: always sketch first

Write the equation:

10. The parabola passes through the point at $(2, -1)$, has its vertex at $(-7, 5)$, and opens to the right.

What is the sign of p ?

Consider $x^2 =$ and $y^2 =$ equations. Which one is a function?

1 Consider the equation $y^2 = 8x + 48$.

a. Find the coordinates of the focus and the vertex and the equations of the directrix and the axis of symmetry.

b. Graph the equation of the parabola.

factor to find p

