9.6: Translate and Classify Conic Sections

Standard form of the 4 Conic Sections:

Parabola: $4p(y - k) = (x - h)^2$ or $4p(x - h) = (y - k)^2$

Circle: $(x - h)^2 + (y - k)^2 = r^2$

Ellipse: $\dfrac{(x - h)^2}{a^2} + \dfrac{(y - k)^2}{b^2} = 1$

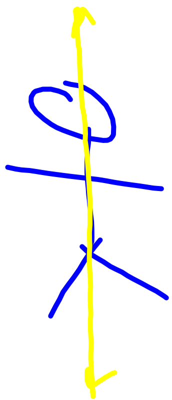
Hyperbola: $\dfrac{(x - h)^2}{a^2} - \dfrac{(y - k)^2}{b^2} = 1$

Distance Midpoint 1	Parabola 2	
Circle 3	Ellipse 4	
Hyperbola 5	Here!! 6	

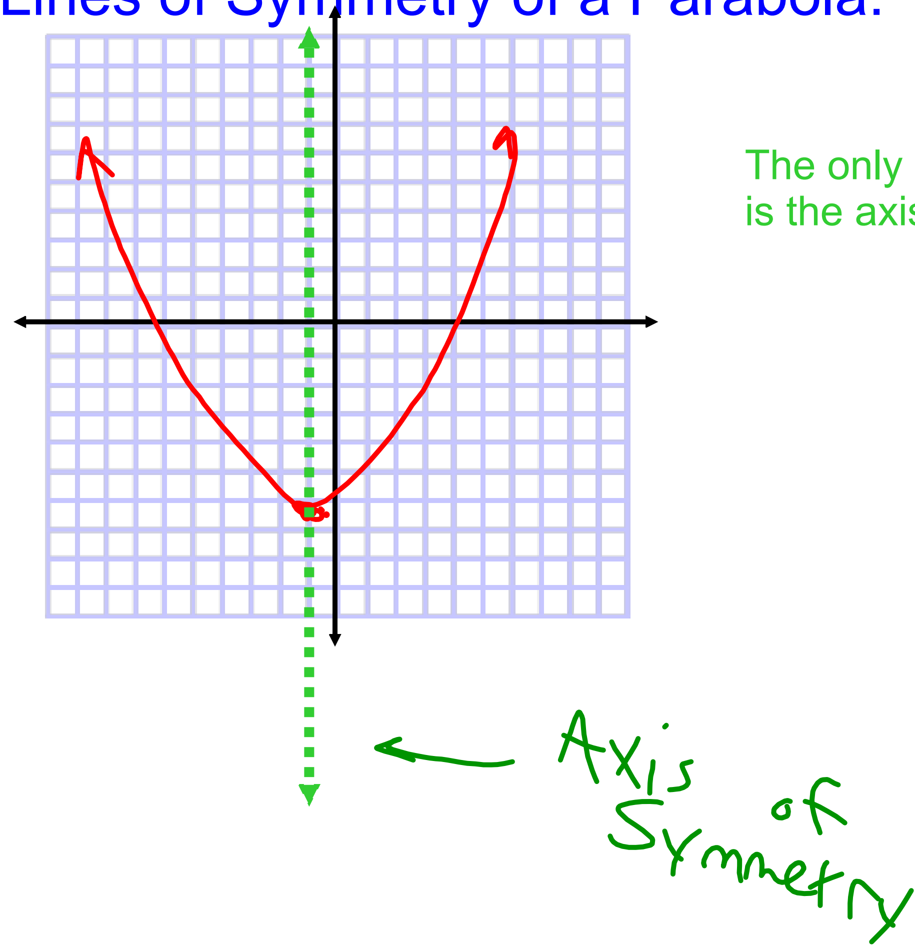
Lines of Symmetry:

What is a line of symmetry:

a line that cuts a shape in 2 symmetrical pieces

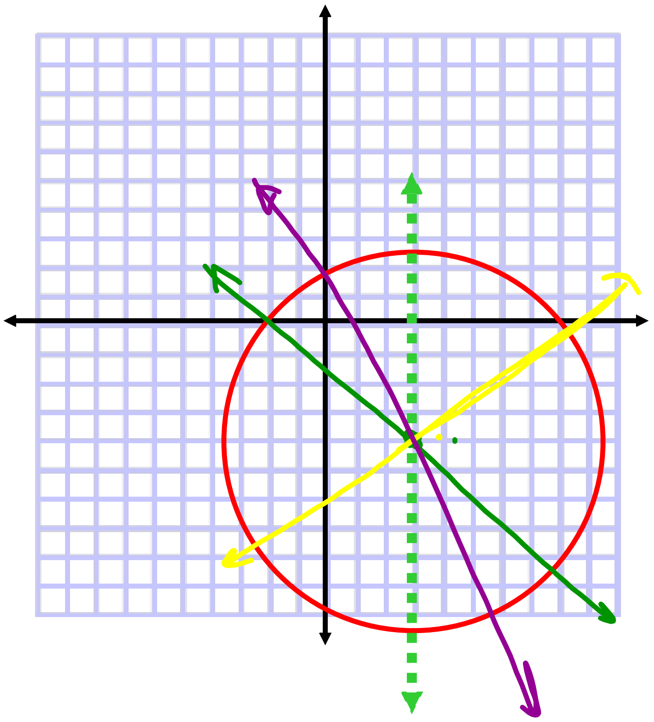


Lines of Symmetry of a Parabola:



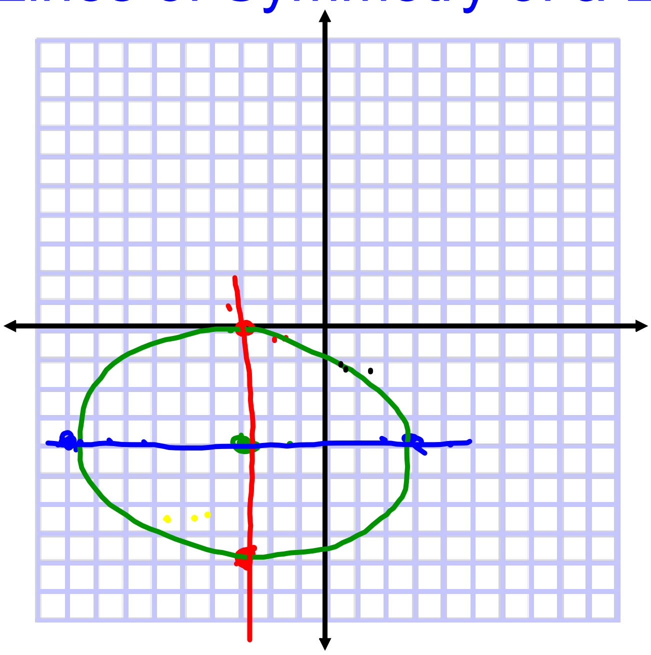
The only line of symmetry is the axis of symmetry

Lines of Symmetry of a Circle:



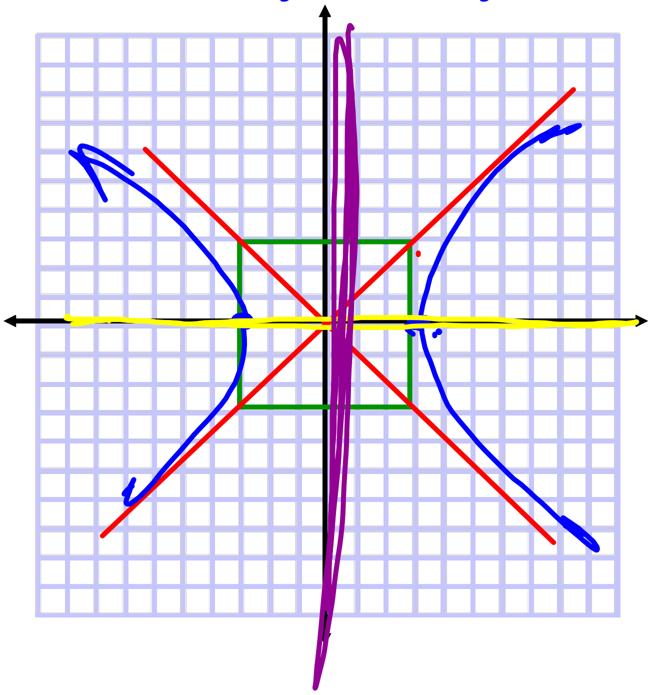
Any line that goes through the center is a line of symmetry

Lines of Symmetry of a Elipse:



the elipse has 2: the major and minor axis

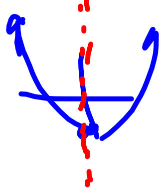
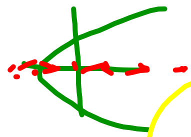
Lines of Symmetry of a Hyperbola:



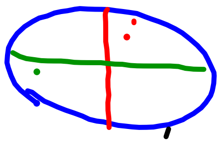
The hyperbola also has 2: the vertical and horizontal line that go through the center.

Distance Midpoint 1	Parabola 2	
Circle 3	Ellipse 4	
Hyperbola 5	6	Here!!

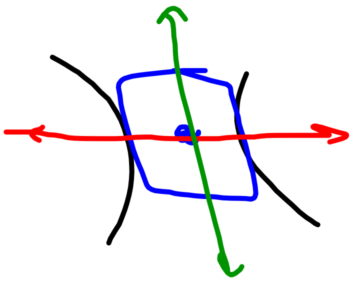
Lines of symmetry

Parabola: if:  $x = h$ if  $y = k$

Circle: any line through (h, k)

Ellipse:  center: (h, k)

$x = h$
$y = k$

Hyperbola: 

$x = h$
$y = k$

Classify each conic section and identify the lines of symmetry.

a. $(x+3)^2+(y-2)^2=16$

Circle

Any line through (-3,2)

b. $(y+3)^2 - \frac{x^2}{25} = 1$

$(0, -3)$

Hyperbola

$x = 0$
$y = -3$

c. $y = \frac{1}{2}(x+6)^2 - 6$

$+6$ $+6$

Parabola

$(2) \cdot y+6 = \frac{1}{2}(x+6)^2 \cdot (2)$

$2(y+6) = (x+6)^2$

Center: $(-6,-6)$

$x = h$

$x = -6$

Write the equation in standard form then classify each conic section.

a. $16x^2 + y^2 + 128x + 2y + 241 = 0$

$16x^2 + 128x \_\_ + y^2 + 2y \_\_ = -241 \_\_ \_\_$

$\frac{\cancel{16}(x^2 + 8x \_\_)}{\cancel{16}} + \frac{y^2 + 2y \_\_}{16} = \frac{-241}{16} \_\_ \_\_$

$\frac{x^2 + 8x + 16}{1} + \frac{y^2 + 2y + 1}{16} = \frac{-241}{16} + 16 + \frac{1}{16}$

$\frac{8}{2} \rightarrow 4^2 \qquad \frac{2}{2} \rightarrow 1^2$

$\frac{(x+4)^2}{1} + \frac{(y+1)^2}{16} = 1$

Ellipse