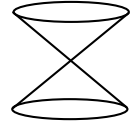


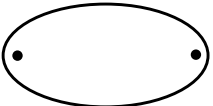

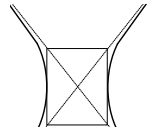
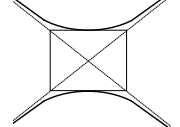

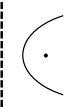



Name: _____

Identifying Conics

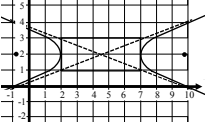
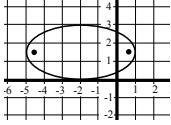
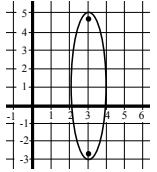
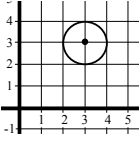
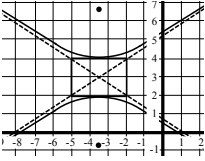
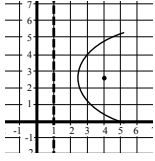
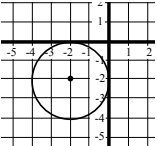
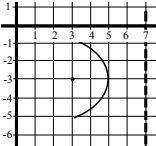
There are four kinds of conic sections: *Ellipses, Circles, Hyperbolas,* and *Parabolas.* They are called conics because they are shapes cut out of two cones standing tip-to-tip. Each conic has its own formula and graph.



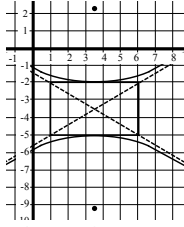
The first step to working with conic sections is being able to identify the conic and its direction. The direction that a conic faces depends entirely on whether *x* or *y* “wins.” Below is a table with examples of the graph and the equation of each of the four conic sections, showing the difference between *x* winning and *y* winning.

<p style="text-align: center;">Ellipse</p> <p><i>2 squared binomials with different denominators: added.</i> Examples:</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  $\frac{(x - 2)^2}{16} + \frac{(y + 8)^2}{9} = 1$ <p>x “wins”...</p> <p><i>when the oval is bigger left-right & when the denominator with x is bigger.</i></p> </div> <div style="text-align: center;">  $\frac{(x + 7)^2}{25} + \frac{(y + 5)^2}{49} = 1$ <p>y “wins”...</p> <p><i>when the oval is bigger up-down & when the denominator with y is bigger.</i></p> </div> </div>	<p style="text-align: center;">Hyperbola</p> <p><i>2 squared binomials: subtracted.</i> Examples:</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  $\frac{(x + 5)^2}{36} - \frac{(y + 2)^2}{100} = 1$ <p>x “wins”...</p> <p><i>when the curves point out left-right & when the fraction with x is positive.</i></p> </div> <div style="text-align: center;">  $\frac{(y + 3)^2}{81} - \frac{(x + 7)^2}{25} = 1$ <p>y “wins”...</p> <p><i>when the curves point out up-down & when the fraction with y is positive.</i></p> </div> </div>
<p style="text-align: center;">Circle</p> <p><i>2 squared binomials: added.</i> Examples:</p> <div style="text-align: center;">  $(x + 4)^2 + (y - 8)^2 = 9$ <p>We are all winners in the circle of math...</p> <p><i>So...neither x nor y wins.</i></p> </div>	<p style="text-align: center;">Parabola</p> <p><i>1 squared binomial: either positive or negative.</i> Examples:</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  $(x + 3) = \frac{2}{8}(y - k)^2$ <p>POSITIVE x “wins”...</p> <p><i>when the parabola opens right & when the x binomial is not squared, and the squared one is positive.</i></p> </div> <div style="text-align: center;">  $(y + 7) = \frac{1}{16}(x + 4)^2$ <p>POSITIVE y “wins”...</p> <p><i>when the parabola opens up & when the y binomial is not squared, and the squared one is positive.</i></p> </div> </div> <hr/> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  $(x + 3) = -\frac{2}{8}(y - k)^2$ <p>NEGATIVE x “wins”...</p> <p><i>when the parabola opens left & when the x binomial is not squared, and the squared one is negative.</i></p> </div> <div style="text-align: center;">  $(y + 7) = -\frac{1}{16}(x + 4)^2$ <p>NEGATIVE y “wins”...</p> <p><i>when the parabola opens down & when the y binomial is not squared, and the squared one is negative.</i></p> </div> </div>

Compare each equation or graph to the table above. Identify the type of conic section and whether x or y “wins.”

<p>1.</p>  <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>	<p>2.</p> $(x - 3)^2 + (y - 7)^2 = 16$ <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>	<p>3.</p>  <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>
<p>4.</p>  <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>	<p>5.</p> $\frac{(x + 3)^2}{64} + \frac{(y - 2)^2}{25} = 1$ <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>	<p>6.</p>  <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>
<p>7.</p> $\frac{(y + 9)^2}{100} - \frac{(x - 3)^2}{144} = 1$ <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>	<p>8.</p>  <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>	<p>9.</p>  <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>
<p>10.</p>  <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>	<p>11.</p>  <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>	<p>12.</p> $(y + 9) = \frac{8}{3}(x - 2)^2$ <p>Identify the Conic Section:</p> <hr/> <p>Circle the “winner”: X or Y For parabolas: positive or negative?</p> <hr/>

13.



Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

14.

$$\frac{(x - 5)^2}{1} - \frac{(y + 1)^2}{36} = 1$$

Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

15.

$$(x + 7) = -24(y - 11)^2$$

Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

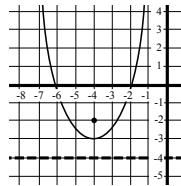
16.

$$(x + 5)^2 + (y - 3)^2 = 25$$

Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

17.



Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

18.

$$\frac{(x + 6)^2}{4} + \frac{(y - 2)^2}{16} = 1$$

Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

19.

$$(x - 3) = \frac{1}{32}(y + 8)^2$$

Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

20.

$$\frac{(x + 5)^2}{9} + \frac{(y - 2)^2}{25} = 1$$

Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

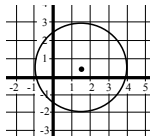
21.

$$\frac{(y - 7)^2}{49} - \frac{(x + 4)^2}{49} = 1$$

Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

22.



Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

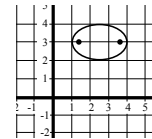
23.

$$(x + 10)^2 + (y - 4)^2 = 169$$

Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?

24.



Identify the Conic Section:

Circle the "winner": X or Y
For parabolas: positive or negative?