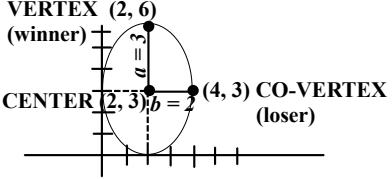
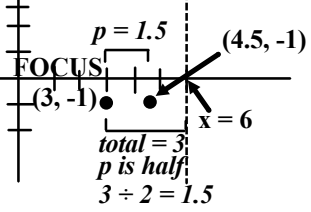


Writing Conic Equations
...from word problems

You know how to write a conic equation from the details. Today, you're going to practice identifying those details from a word problem and then using them to write a conic equation.

<p>EXAMPLE Write the equation in standard form for an ellipse with center (2, 3), vertex (2, 6) and co-vertex (4, 3).</p> <p><i>Sketch it out - vertex is always in the winning direction; co-vertex is in the losing direction</i></p>  <p>VERTEX (2, 6) (winner)</p> <p>CENTER (2, 3) CO-VERTEX (4, 3) (loser)</p> <p><i>y wins, a is 3, b is 2 and (h, k) is (2, 3).</i></p> $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ $\frac{(x-2)^2}{3^2} + \frac{(y-3)^2}{2^2} = 1$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> $\frac{(x-2)^2}{9} + \frac{(y-3)^2}{4} = 1$ </div>	<p>EXAMPLE Determine the equation of the parabola with its focus at (3, -1) and directrix at x = 6.</p> <p><i>Sketch it out - the center is always halfway between the focus (point) and the directrix (line).</i></p>  <p>FOCUS (3, -1)</p> <p>(4.5, -1)</p> <p>$x = 6$</p> <p>$p = 1.5$</p> <p>total = 3 p is half! $3 \div 2 = 1.5$</p> <p><i>p is 1.5, so the center is at (4.5, -1) and it will point left, so -x wins.</i></p> $x - h = -\frac{1}{4p}(y - k)^2$ $x - (4.5) = -\frac{1}{4(1.5)}(y - (-1))^2$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> $x - 4.5 = -\frac{1}{6}(y + 1)^2$ </div>	<p>EXAMPLE Write the equation of the circle with a radius of 2 and a center at (0, 1).</p> <p><i>For circles, all you have to do is plug in your information.</i></p> <p>$(h, k) = (0, 1) \text{ \& } r = 2$</p> $(x-h)^2 + (y-k)^2 = r^2$ $(x-0)^2 + (y-1)^2 = 2^2$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> $x^2 + (y-1)^2 = 4$ </div>
<p>1. Determine the equation of the parabola with its focus at (5, 4) and directrix at y = 8.</p>	<p>2. Write the equation in standard form for an ellipse with center (4, 9), vertex (-2, 9) and co-vertex (4, 5).</p>	<p>3. Write the equation in standard form for a hyperbola with center (8, 1), vertex (6, 1) and co-vertex (8, 5).</p>
<p>4. Write the equation of the circle with a radius of 5 and a center at (-3, 4).</p>	<p>5. Write the equation in standard form for a hyperbola with center (-2, -5), vertex (-2, 7) and co-vertex (5, -5).</p>	<p>6. Write the equation in standard form for an ellipse with center (8, 9), vertex (8, 7) and co-vertex (9, 9).</p>
<p>7. Write the equation in standard form for a hyperbola with center (10, -2), vertex (6, -2) and co-vertex (10, -6).</p>	<p>8. Determine the equation of the parabola with its focus at (2, -1) and directrix at x = -3.</p>	<p>9. Write the equation of the circle with a radius of 8 and a center at (0, -3).</p>

<p>10. Determine the equation of the parabola with its focus at $(4, 1)$ and directrix at $y = -1$.</p>	<p>11. Write the equation of the circle with a radius of 1 and a center at $(-3, 7)$.</p>	<p>12. Write the equation in standard form for an ellipse with center $(0, 0)$, vertex $(0, 5)$ and co-vertex $(-3, 0)$.</p>
<p>13. Write the equation in standard form for an ellipse with center $(-5, -2)$, vertex $(-1, -2)$ and co-vertex $(-5, 0)$.</p>	<p>14. Write the equation in standard form for a hyperbola with center $(8, 0)$, vertex $(8, -3)$ and co-vertex $(1, 0)$.</p>	<p>15. Determine the equation of the parabola with its focus at $(3, 1)$ and directrix at $x = 6$.</p>
<p>16. Write the equation in standard form for an ellipse with center $(5, 5)$, vertex $(5, 0)$ and co-vertex $(4, 5)$.</p>	<p>17. Write the equation of the circle with a radius of 3 and a center at $(-1, -3)$.</p>	<p>18. Write the equation in standard form for a hyperbola with center $(2, 0)$, vertex $(-3, 0)$ and co-vertex $(2, 8)$.</p>
<p>19. Write the equation in standard form for a hyperbola with center $(4, -4)$, vertex $(4, 2)$ and co-vertex $(11, -4)$.</p>	<p>20. Determine the equation of the parabola with its focus at $(8, 2)$ and directrix at $y = -3$.</p>	<p>21. Write the equation of the circle with a radius of 6 and a center at $(2, 7)$.</p>
<p>22. Write the equation of the circle with a radius of 7 and a center at $(-3, 5)$.</p>	<p>23. Write the equation in standard form for an ellipse with center $(7, 9)$, vertex $(7, 11)$ and co-vertex $(8, 9)$.</p>	<p>24. Determine the equation of the parabola with its focus at $(1, 4)$ and directrix at $x = 5$.</p>