REMINDERS FOR CONICS:

Circle: _____ squared terms with _____ coefficients, both are _____

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

key values for graphing:
   (h, k) = center
   r = radius

Parabola: _____ squared term (one vertex)

$$(x-h)^2 = \underline{}(y-k) \qquad (y-k)^2 = \underline{}(x-h)$$

key values for graphing:
   (h, k) = center
      p = distance from vertex to **focus** point
            and from vertex to **directrix** line
      $\underline{}$ = **focal diameter**

Ellipse: _____ squared terms with _____ coefficients, both are _____

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1 \qquad \frac{(x-h)^2}{b^2} + \frac{(y-k)^2}{a^2} = 1$$

a^2 is always the _____ denominator for ellipse and will dictate the horizontal/vertical orientation

key values for graphing:
   (h, k) = center
   a is the distance from center to each vertex
   2a = MAJOR axis (contains **both** major **vertices**)
   2b = MINOR axis

foci: _____

Hyperbola: ____squared terms, **one term** is _____ due to subtraction

$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1 \qquad \frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$$

a^2 is always with the _____ term for a hyperbola and will dictate the horizontal/vertical orientation.

key values for graphing:
   (h, k) = center
   a is the distance from center to each vertex
   2a = transverse axis (contains **both vertices**)
   use a and b to sketch central box & asymptotes

foci: _____

TODAY'S ASSIGNMENT: Mixed Conics

IDENTIFY the conic, complete the square to write each equation in STANDARD FORM, then GRAPH it. Only identify key values needed for graphing such as the center, vertex, radius, and the a, b, or p values.

1. $x^2 - 4y - 6x + 9 = 0$
2. $x^2 - 8x + y^2 + 6y + 24 = 0$
3. $x^2 - 3y^2 + 2x - 24y - 41 = 0$
4. $9x^2 + 25y^2 - 54x - 50y - 119 = 0$
5. $x^2 = y + 8x - 16$
6. $x^2 - 4x - y^2 - 5 - 4y = 0$
7. $5x^2 + 2y^2 - 40x - 20y + 110 = 0$
8. $x^2 - 8x + 11 = -y^2$
9. $8y^2 - 9x^2 - 16y + 36x - 100 = 0$
10. $4y^2 + 4y + 8x = 15$

CHECK ANSWERS:

parabola   parabola   parabola   ellipse   ellipse
hyperbola   hyperbola   hyperbola   circle   circle

$$\left(y+\frac{1}{2}\right)^2 = -2(x-2) \qquad \frac{(y-1)^2}{9} - \frac{(x-2)^2}{8} = 1$$

$$(x-4)^2 + (y+3)^2 = 1 \qquad \frac{(y+4)^2}{2} - \frac{(x+1)^2}{6} = 1$$

$$(x-4)^2 + y^2 = 5 \qquad \frac{(x-2)^2}{5} - \frac{(y+2)^2}{5} = 1$$

$$(x-4)^2 = y \qquad \frac{(x-3)^2}{25} + \frac{(y-1)^2}{9} = 1$$

$$(x-3)^2 = 4y \qquad \frac{(x-4)^2}{4} + \frac{(y-5)^2}{10} = 1$$