

10.5 Videos Guide

10.5a

- Equations of conic sections
 - Circle
 - $(x - h)^2 + (y - k)^2 = r^2$
 - Parabolas
 - Horizontally oriented axis of symmetry
 - $y^2 = 4px$
 - $(y - k)^2 = 4p(x - h)$
 - Vertically oriented axis of symmetry
 - $x^2 = 4py$
 - $(x - h)^2 = 4p(y - k)$

10.5b

- Introduction to the ellipse

10.5c

- Equations and properties of ellipses
 - Ellipses
 - Horizontally oriented major axis
 - $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
 - $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$
 - Vertically oriented major axis
 - $\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$
 - $\frac{(x-h)^2}{b^2} + \frac{(y-k)^2}{a^2} = 1$
 - Note that $a > b$
 - Locations of foci are given by $a^2 = b^2 + c^2$
 - Eccentricity is $e = \frac{c}{a}$ (more circular if e is close to 0 and more elongated if e is close to 1)

10.5d

- Hyperbolas
 - Horizontally oriented transverse axis
 - $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$
 - $\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$

- Vertically oriented transverse axis
 - $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$
 - $\frac{(y-k)^2}{b^2} - \frac{(x-h)^2}{a^2} = 1$
- Location of foci are given by $c^2 = a^2 + b^2$

10.5e

- Asymptotes of a hyperbola: $y - k = \pm \frac{b}{a}(x - h)$