

Ellipse



STUDY FOR FE

Compare these equations with the ones in NCEES® FE Handbook?

Standard Equation:

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

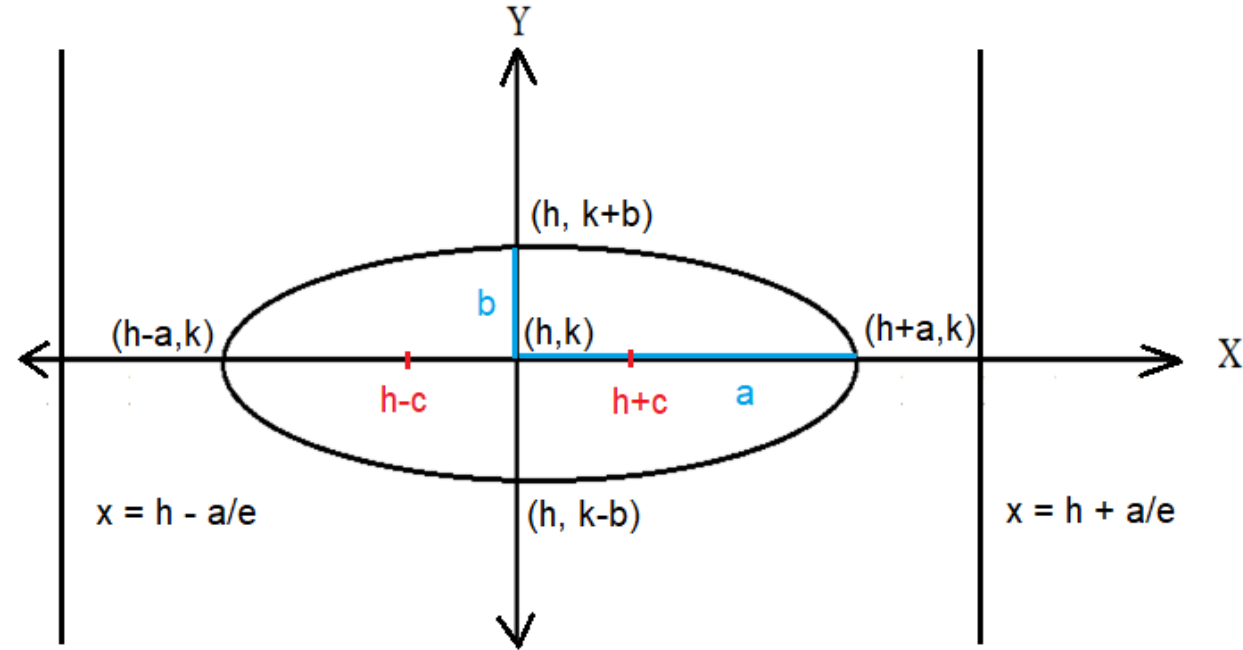
Center (h, k)

Vertices $(h \pm a, k)$ $(h, k \pm b)$

Eccentricity < 1 $e = \sqrt{1 - \left(\frac{b^2}{a^2}\right)} = \frac{c}{a}$
 $c^2 = a^2 - b^2$

Focus $(h \pm c, k)$

Directrix $x = h \pm \frac{a}{e} = h \pm \frac{a^2}{c}$



- Circle has eccentricity = 0
- Ellipse has + sign between squares.
- 'a' is always greater than 'b'
- If 'a' shows up under 'x²', we have a wide/fat ellipse.

Ellipse

NCEES® FE Reference Handbook Pages 39 – 45



STUDY FOR FE

Standard Equation:

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

Center (h, k)

Vertices $(h, k \pm a)$ $(h \pm b, k)$

Eccentricity < 1 $e = \sqrt{1 - \left(\frac{b^2}{a^2}\right)} = c/a$

$$c^2 = a^2 - b^2$$

Focus $(h, k \pm c)$

Directrix $y = k \pm \frac{a}{e} = k \pm \frac{a^2}{c}$

This form is not given in NCEES® FE Handbook?

- Ellipse has + sign between squares.
- 'a' is always greater than 'b'
- If 'a' shows up under 'y²', we have a tall/slim ellipse.

