

MAC1140 Handout

@ imathesis.com

1. Ellipse:

a) Major axis is $y = 0$, the x axis:

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

b) Major axis is $x = 0$, the y axis:

$$\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$$

Relationship between a , b , and c given by $a^2 = b^2 + c^2$.

1. Hyperbola:

a) Transversal axis is $y = 0$, the x axis:

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

b) Transversal axis is $x = 0$, the y axis:

$$\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$$

Relationship between a , b , and c given by $c^2 = a^2 + b^2$.

3. Sum of Arithmetic Sequence Formula:

$$S_n = \frac{n(a_1 + a_n)}{2}$$

4. Sum of Geometric Sequence Formulas:

$$S_n = a_1 \left(\frac{1 - r^n}{1 - r} \right) \quad \text{and} \quad S_\infty = \frac{a_1}{1 - r}$$

5. Binomial Theorem:

$$(a + b)^n = \sum_{j=0}^n \binom{n}{j} a^{n-j} b^j$$