

MA 16020 EXAM 3 STUDY GUIDE: ALGEBRA

USEFUL DEFINITIONS

1. Point at the origin \Rightarrow $(0,0)$

2. Lines \Rightarrow $y = mx + b$ where m is the slope and b is the y-intercept

3. Parabolas \Rightarrow $y = a(x - h)^2 + k$ where (h, k) is the vertex of the parabola

4. Exponential Functions

a. Increasing \Rightarrow example $y = e^x$
b. Decreasing \Rightarrow example $y = e^{-x}$

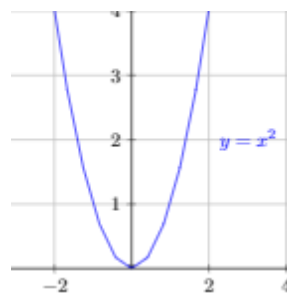
5. Logarithmic Functions

a. Increasing \Rightarrow example $y = \ln x$
b. Decreasing \Rightarrow example $y = -\ln x$

6. Rational Functions are functions of the form: $y = \frac{p(x)}{q(x)}$

a. x-axis symmetry \Rightarrow $f(x) = -f(x)$

b. y-axis symmetry \Rightarrow $f(x) = f(-x)$



7. Circles \Rightarrow $(x - h)^2 + (y - k)^2 = r^2$ where r is radius and (h, k) is the center

8. Ellipses \Rightarrow $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ where (h, k) is the center

9. Hyperbolas \Rightarrow $\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$ where (h, k) is the center

To find the foci for 8 and 9, we use the equation $c^2 = a^2 + b^2$, and solve for c .