Mini-Lecture 1.2

Graphs of Equations in Two Variables; Intercepts; Symmetry

Learning Objectives:

1. Graph equations by plotting points
2. Find intercepts from a graph
3. Test an equation for symmetry with respect to the x-axis, the y-axis, and the origin
4. Know how to graph key equations

Examples:

1. Determine whether the points (0,3), (-2,0), and (2,7) are on the graph of the equation $y = x^3 - 2x + 3$.
2. Find the intercepts of the equation $y = 2x - 1$ by plotting points.

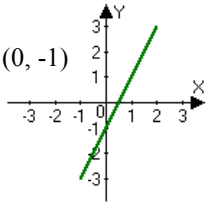
3. List the intercepts and test for symmetry for each equation.

$(a)\ y^2 - x - 4 = 0 \qquad (b)\ y = \dfrac{x}{x^2 - 4}$

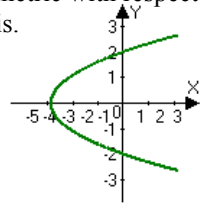
Teaching Notes:

- When graphing by plotting points, be sure to emphasize that the *y*-coordinate is determined by the value of *x*. This will help establish the function concept later.
- Emphasize how to find intercepts algebraically by setting *x=0* to find the *y*-intercept(s) and then *y=0* to find the *x*-intercept(s).
- Symmetry can be seen and identified, but students will often have trouble testing for symmetry algebraically. They will make a lot of sign errors, so that needs to be reinforced.
- Emphasize the graphing of the key functions. It is important that they know the basic shapes of these graphs when this topic is revisited later in the course.

Answers: **1.** Yes, No, Yes **2**. (1/2,0), (0, -1)



3. (a) (0,2),(0,-2),(-4,0)
Symmetric with respect to the *x*-axis.



3. (b) (0,0) Symmetric with respect to the origin.