

Unit 2 Lesson 2

Graphical Analysis of Equations

Introduction

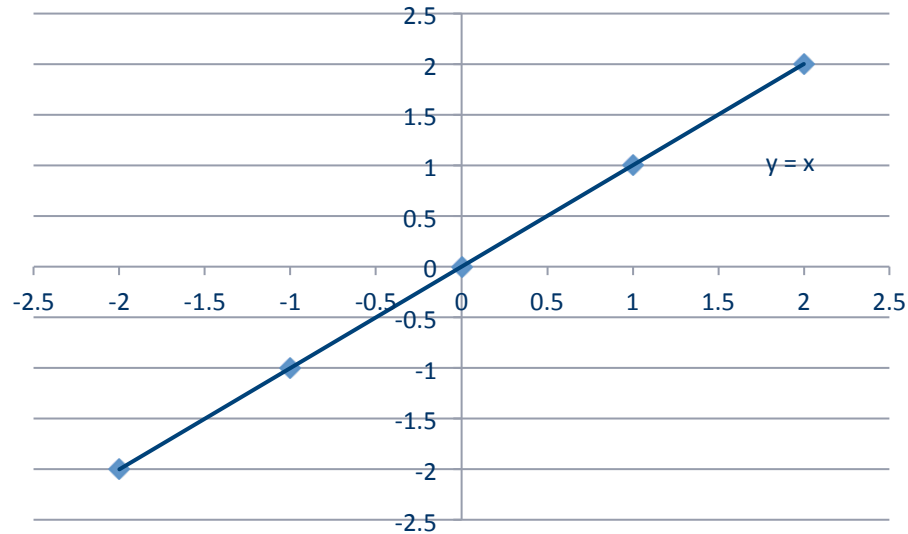
- Graphical analysis allows for easy visualization of the problem
- For more information see
- <http://www.purplemath.com/modules/graphlin.htm>
- <http://www.purplemath.com/modules/ineqgrph.htm>

Linear Graphs

- Standard form $y = mx + b$
- y is the vertical axis
- x is the horizontal axis
- m is the slope of the line
 - $\Delta y / \Delta x$
 - $M = 2 \Rightarrow y$ increases by 2 as x increases by 1
- b is the y intercept of the line
 - Where the line crosses the y axis

The Simplest Plot

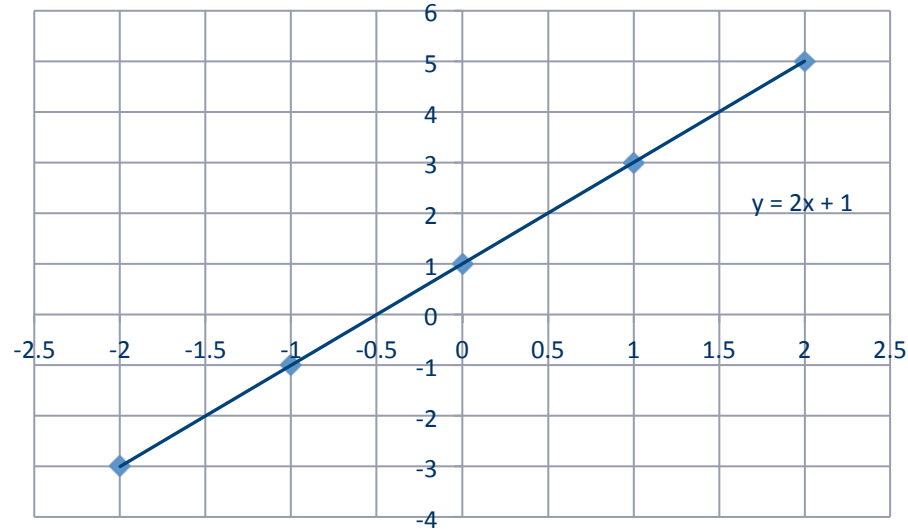
- $y = x$
- $m = 1$
- $b = 0$



- Notice that it crosses the y axis at $y = 0$ and y increases by 1 as x increases by 1

A Basic Line Plot

- $y = 2x + 1$
- $M = 2$
- $B = 1$



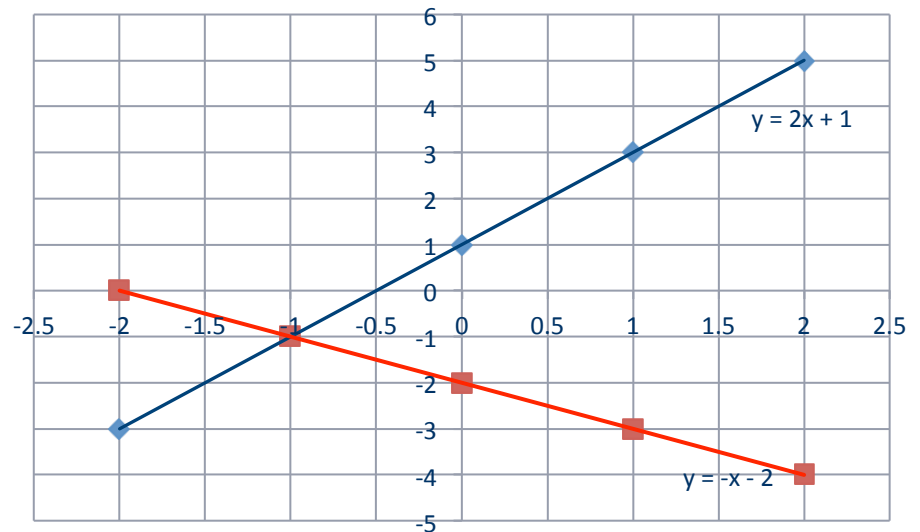
- Notice that it crosses the y axis at $y = 1$ and y increases by 2 as x increases by 1

Solving Equations Graphically

- Graph both equations
- Find intersection point
- If no intersection, there is no solution

Example

- Solve graphically for x and y
- $y = 2x + 1$ $y = -x - 2$
- Intersection at $(-1, -1)$
- $x = -1$ $y = -1$



Inequalities

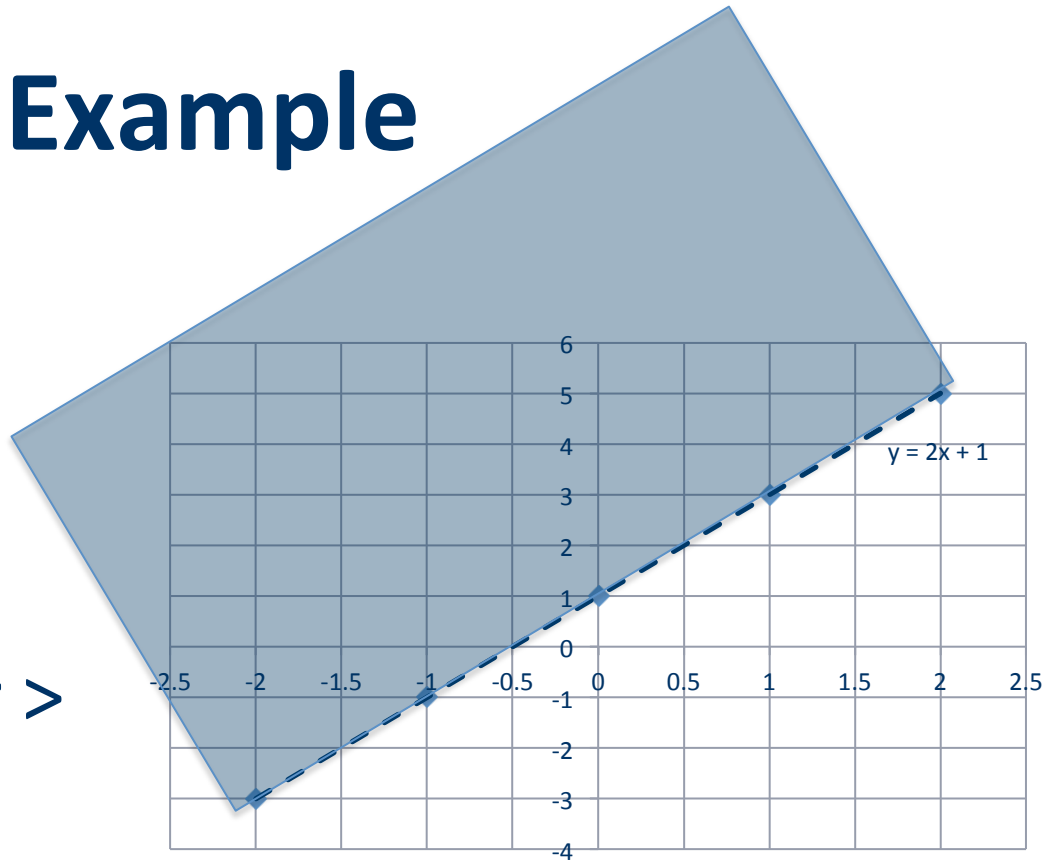
- $y > x$
 - y is any value greater than x
- $y < x$
 - y is any value less than x
- $y \geq x$
 - y is any value greater than or equal to x
- $y \leq x$
 - y is any value less than or equal to x

Graphing Inequalities

- Graph equation as normal
- If $<$ or $>$ use dashed line, if \leq or \geq use solid line
- Shade appropriate region for y

Example

- $y > 2x + 1$
- Graph normally
- Dashed line
- Shade above for $>$



System of Inequalities

- Graph each inequality
- Shade appropriate areas of each
- Answer is overlap of shaded region

Example

- $y > 2x + 1$ $y \geq -x - 2$
- Answer is overlap of shaded regions

