Math 120 Intermediate Algebra

Inequalities in Two Variables

Recall – A linear equation has the form $Ax + By = C$. When $=$ is replaced by $<$, $>$, $\leq$, or $\geq$, a linear inequality is formed. The graph of a linear equation is a line. The graph of a linear inequality is a half-plane with a boundary that is a line.

Ex 1 Graph on a plane. (Graph the region.) Outline Steps

a) $3x + 4y \leq 12$  
b) $3x - 2 < 5x + y$  
c) $0 \leq x < 6$

Ex 2 Graph each system.

a) \[
\begin{cases}
y \geq x \\
y \leq -x + 4
\end{cases}
\]

b) \[
\begin{cases}
2y - x \leq 2 \\
y - 3x \geq -4 \quad \text{Find the coordinates of the vertices formed.}
y \geq -1
\end{cases}
\]

Intro to $y = x^3$

Graph the base function $y = x^3$ and $y = x^3 + 2$.

\begin{itemize}
  \item Recall $y = x^2$ and $y = |x|$ - handouts
  \item How do we differentiate between a linear and nonlinear function? Defn and graph
\end{itemize}

Review with Handouts (Shifting)– Parabola Plots, Absolute Value Functions, Cubics