

2.6 Review Graphing Inequalities

Find the max & min values of $f(x,y) = y - 2x + 5$
for the polygonal convex set determined
by the system of inequalities.

$$\textcircled{1} \quad x \geq 1$$

$$\textcircled{2} \quad y \leq 8$$

$$\textcircled{3} \quad y \geq 2$$

$$\textcircled{4} \quad 2x + y \leq 14 \quad \rightarrow \quad \begin{array}{l} 2x + y \leq 14 \\ -2x \quad -2x \end{array}$$

$$\textcircled{5} \quad \begin{array}{l} x + y \geq 5 \\ -x \quad -x \end{array} \quad \begin{array}{l} y \leq -2x + 14 \\ \text{slope} \quad \uparrow \text{y-int} \end{array}$$

$$y \geq -x + 5 \quad \begin{array}{l} \uparrow \text{slope} \quad \uparrow \text{y-int} \end{array}$$

Max or min always occurs at a vertex

$$f(x,y) = y - 2x + 5$$

$$f(1,8) = 8 - 2(1) + 5 = 11$$

$$f(3,8) = 8 - 2(3) + 5 = 7$$

$$f(6,2) = 2 - 2(6) + 5 = -5$$

$$f(1,4) = 4 - 2(1) + 5 = 7$$

$$f(3,2) = 2 - 2(3) + 5 = 1$$

\therefore Max is 11
@ (1,8)

Min is -5
@ (6,2)