5. Graph the feasible region for the following LPP. You will be graded on three aspects: correctly drawn edges, correctly shaded region, and correctly labelled corners. (The numbers in this problem are not related to either word problem, but you may find the picture on #6 to be a good model of clear edges, corners, and labels).

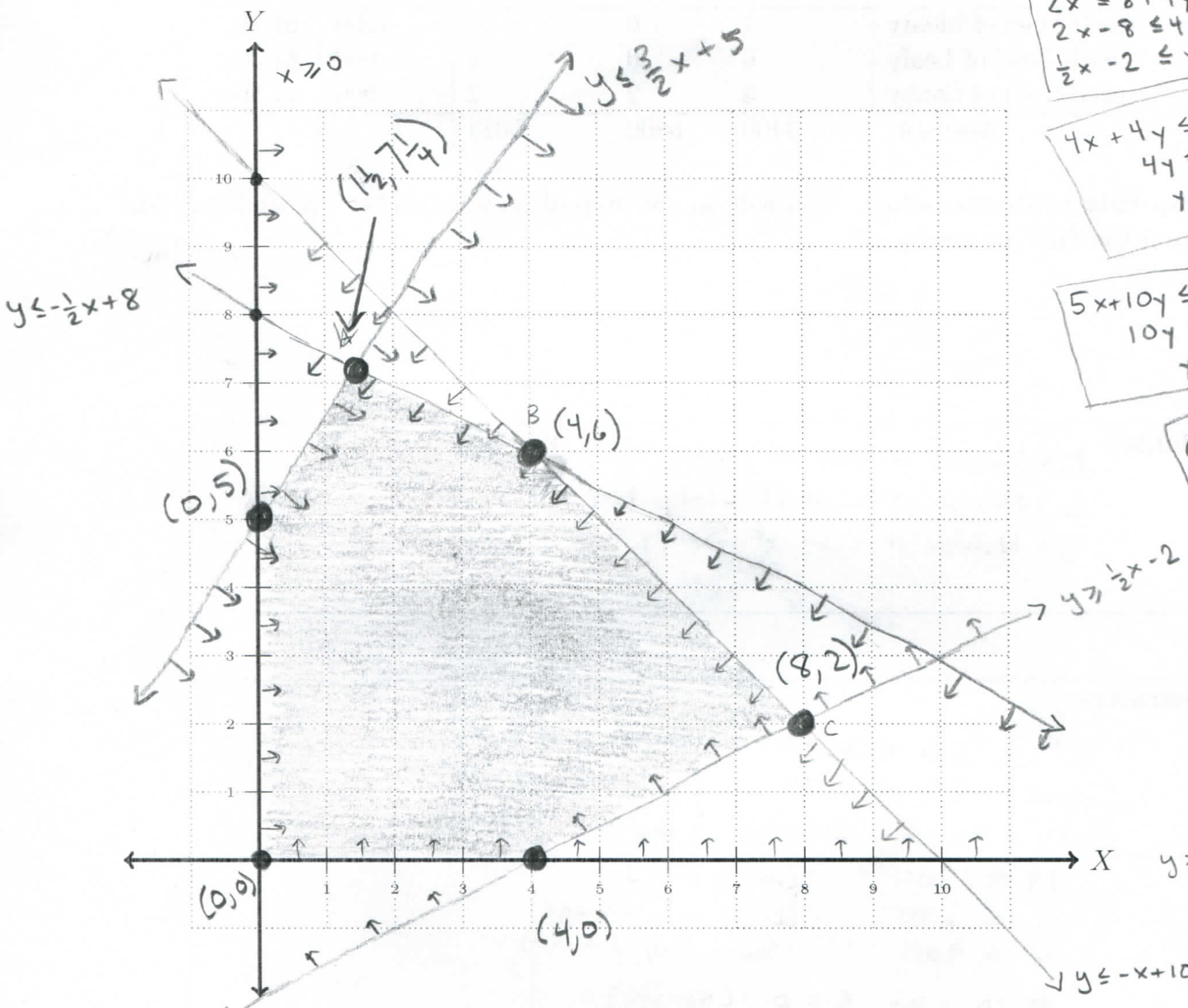
Maximize $S = 2x + 3y$ subject to $\left\{ \begin{array}{c} 2x \le 8 + 4y \\ 4x + 4y \le 40 \\ 5x + 10y \le 80 \\ 6y \le 9x + 30 \end{array} \right\}$ and $x \ge 0$, $y \ge 0$.

$2x \le 8+4y$
$2x - 8 \le 4y$
$\frac{1}{2}x - 2 \le y$

$4x + 4y \le 40$
$4y \le -4x + 40$
$y \le -x + 10$

$5x + 10y \le 80$
$10y \le -5x + 80$
$y \le -\frac{1}{2}x + 8$

$6y \le 9x + 30$
$y \le \frac{3}{2}x + 5$



Is this region bounded or unbounded? Bounded.

A
$y = \frac{3}{2}x + 5$
$y = -\frac{1}{2}x + 8$
$\frac{3}{2}x + 5 = -\frac{1}{2}x + 8$
$2x = 3$ $\quad y = \frac{3}{2}x + 5$
$x = 1\frac{1}{2}$ $\quad y = \frac{3}{2}(\frac{3}{2}) + 5 = \frac{9}{4} + 5 = 7\frac{1}{4}$

B
$y = -\frac{1}{2}x + 8$
$y = -x + 10$
$-\frac{1}{2}x + 8 = -x + 10$
$\frac{1}{2}x = 2$
$x = 4$
$y = -4 + 10 = 6$

C
$y = \frac{1}{2}x - 2$
$y = -x + 10$
$\frac{1}{2}x - 2 = -x + 10$
$\frac{3}{2}x = 12$
$x = 8$
$y = -8 + 10 = 2$