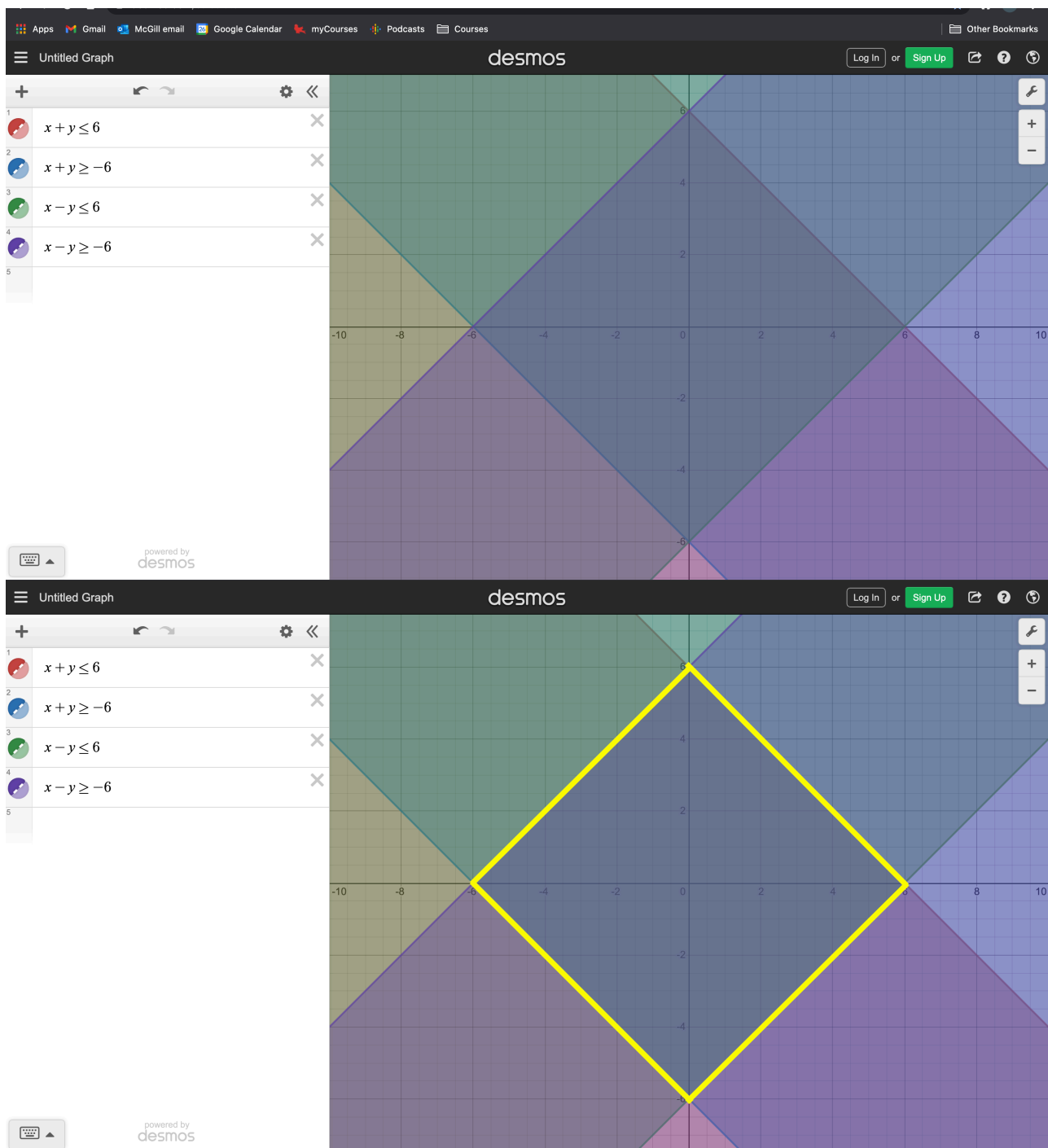


Q4

Q4 Part 1:

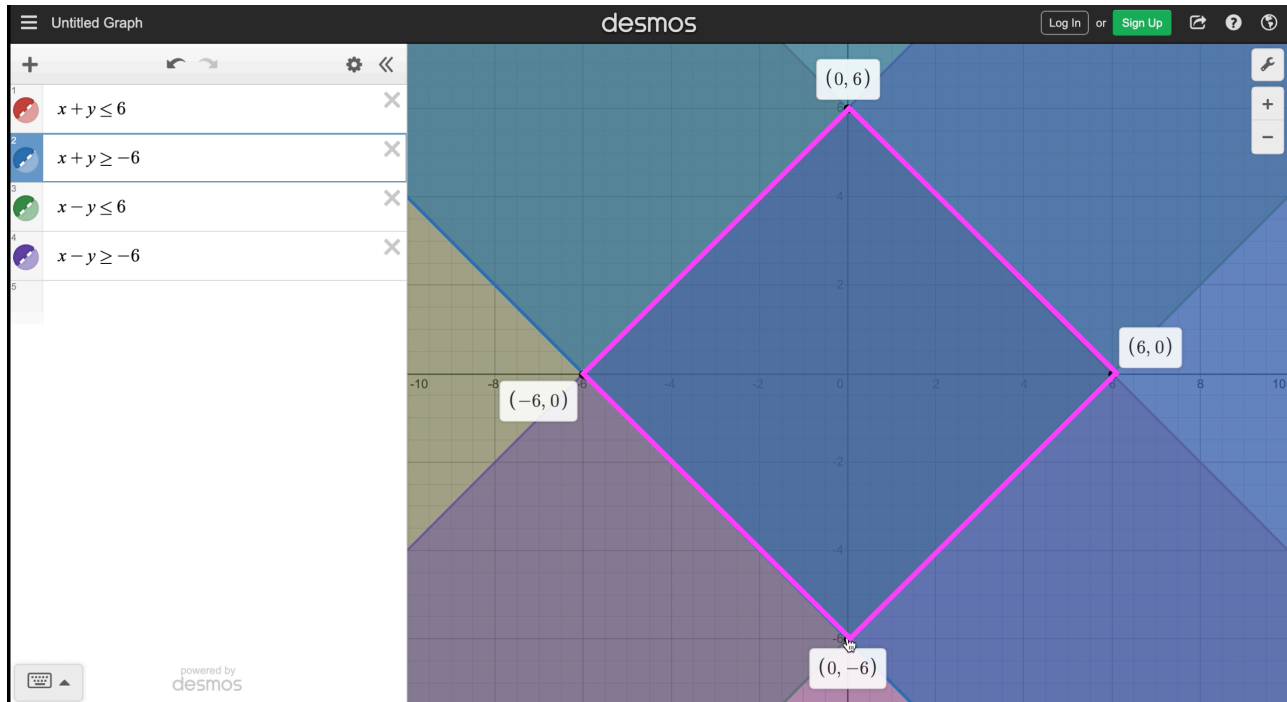
If we draw all the constraint this is what we get, the feasible region is the yellow area in the second graph (area shared between all the constraints).



Q4 Part 2:

The optimal solutions happen at the vertices, so any where on the border of the feasible region. Depending on the objective function any of the four vertices, or the line connecting each two vertices could be the optimal solution.

Essentially any of the pink lines could be the optimal solution or the vertices. So either one of the points $(0,6)$, $(6,0)$, $(-6,0)$, or $(0,-6)$, or the lines connecting them.



Q4 Part 3:

Even if the objective function is not constant any of the points that can be the optimal solution for this problem (as described above) can be the optimal solution.

Q4 Part 4:

The unique optimal solutions happen at the vertices so at any of the 4 pink point in the graph, specifically one of these points: $(0,6)$, $(6,0)$, $(-6,0)$, or $(0,-6)$.

