[15] **8.** Our factory makes portable computer memory sticks in two styles. The Hello Kitty model, aimed at Facebook lovers, requires one logic circuit, one crypto chip, and two memory chips; each assembled unit earns a profit of 4 dollars. The Black Lightning model, styled for paranoid hackers, requires one logic circuit, two crypto chips, and one memory chip; each unit earns a profit of 5 dollars. We just got a new shipment of parts (the factory was empty!): 5000 logic circuits, 8000 crypto chips, and 8000 memory chips. Suppose we manufacture $1000x_1$ Hello Kitty units and $1000x_2$ Black Lightning units.

(a) Write the linear program we can use to plan our production to maximize total profit.
The resulting LP should look familiar. If it doesn't, re-read all the questions on this exam.

(b) The delivery driver offers to sell us a few extra logic circuits for $2.50 each. Should we buy some? Why? What if the asking price is $3.50 each?

(c) The retailer who buys our products telephones with a nasty surprise: paranoid hackers are scaring away respectable customers. The retailer insists that $x_2 \leq x_1$. Show how to use the Dual Simplex Method to determine our revised production plan when this constraint is added to our problem. What happens to our profit?

(d) Part (c) was just a bad dream. Forget it. This morning we have good news. Our co-op student has figured out how to make a pocket music player using 2 logic circuits, 1 crypto chip, and 2 memory chips. What value(s) of profit-per-unit on music players would motivate us to change our current plan and make some? How will our overall production strategy change in this case?

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