CS 2850 – Networks HW 4

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1. (a) Buyer y will bid the highest value at 7, and thus, win the auction because each buyer bids fairly in a second price auction. In addition, y will pay the second highest bid which is 5.

   (b) We start with creating two other fictional items b, c. After running the VCG procedure, we observe that item a goes to y for 5 as before, item b goes to x at 0, and item c goes to z at 0. Note that 5 is the harm that y causes to x, z because 5 is the value that a would be obtained at without y.

2. (a) The perfect matching that is yielded by treating the Allocating Slots to Advertisers problem as a matching market is the following: $x \to a$ at 0, $y \to c$ at 8, and $z \to b$ at 23.