Math 130   Elementary Linear Algebra   University of San Francisco

Assignment Sheet #1

1.   The Bromberg Publishing Company produces both paperback and hardcover books. For each paperback book the company spends on average $6 for paper and $2 for the cover, while the average expenses of producing a hardcover book are $10 for paper and $12 for the cover. If the publishing budget allows spending $140,000 for paper and $90,000 for covers, then what number of books of each kind can be produced?

2.   A businessman imports products from South America and needs to carry with him fixed amounts of the local currency each time he travels to Venezuela and Chile. Last year he made two trips: on the first trip he exchanged a total of $5000, when 1 dollar was worth 1200 Bolivars in Venezuela and was worth 700 Pesos in Chile; on his second trip he exchanged a total of $4750, when 1 dollar was worth 1400 Bolivars or 600 Pesos. What were the amounts of Bolivars and Pesos that he took with him each time?

3.   A good Holstein gives 3500 more pounds of milk per year than a good Jersey. Together they give 28,500 pounds of milk per year. How many pounds of milk per year does each of them give?

4.   Epsilon Airlines offers daily nonstop flights between San Francisco and Boston, a distance of approximately 2,700 miles. The published flight schedule shows the following departure and arrival times:

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Eastward: Departs SFO at 7:00am and arrives BOS at 3:30pm
Westward: Departs BOS at 9:45am and arrives SFO at 1:15pm
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One must keep in mind here, when figuring the flying times, that a 3-hour time-difference exists between the two cities, and the shorter duration of a flight going from west to east is chiefly due to a strong prevailing wind which exists at the upper altitudes. Assuming that the pilots would be flying at full speed regardless of the plane's direction, then what is the speed of the prevailing eastward wind, and how fast would a plane be flying if the upper atmosphere were stationary?

5.   When student leaders in the Mathematics and Physics Departments decided to organize a joint picnic, there were 80 students who attended. Later each Department separately counted how many of its own majors were present, and when the numbers were compared it was discovered that the number of Math majors attending the picnic was twice as large as the number of Physics majors there; however, seven of the attendees were "double-majors" and so had been counted twice. How many Math majors, and how many Physics majors, attended this picnic?