Linear System and Statistics Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Matrix multiplication word problems

Follow instructions on the following problems and show all of your work

1. The student council is selling flowers for mother’s day. They bought 200 roses for $1.67 each, 150 daffodils for $1.03 each and 100 orchids for $2.59 each. They sold the roses for $3.00 each, the daffodils for $2.25 each and the orchids for $4.50 each.
   1. Organize the data in two matrices, and use matrix multiplication to find the total amount spent of the flowers. ($747.50)
   2. Write two matrices, and use matrix multiplication to find the total amount the student council received for the flower sale. ($1387.50)
   3. Use matrix operations to find how much money the student council made on the project. ($640.00)
2. The first table shows points awarded by the judges at the New England Sheep and Wool Fair for each competition. The second table shows the degree of difficulty of each piece.
   1. Create matrices to organize the given information.
   2. Find the total score for each contestant.

Points Awarded Degree of Difficulty

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Contestant | Wall | Clothing | Rug |  |  | Category | Madison | Devyn | Ali |
|  | Hanging |  |  |  |  | Wall Hanging | 2 | 3 | 2 |
| Madison | 16.5 | 18 | 17.5 |  |  | Clothing | 3 | 3 | 1 |
| Devyn | 12.5 | 14.0 | 17.0 |  |  | Rug | 2 | 2 | 1 |
| Ali | 16.0 | 19.5 | 18.0 |  |  |  |  |  |  |

1. A hardware store sells hammers for $3.00, Flashlights for $5, and Lanterns for $7.00. Store A sold 10 hammers, 2 flashlights and 2 lanterns. Store B sold 9 hammers, 14 flashlights and 5 lanterns. Store C sold 8 hammers, 6 flashlights and 7 lanterns.
   1. Create a matrix for the Prices and a separate one for the Number of Items sold per store.
   2. Find the product of the two matrices and explain in complete sentences what the product of the two matrices represents. (59 132 103)
   3. How would you find the total gross revenue from all three stores? (Add the elements of the product matrix in Part b)
   4. Find the total gross revenue from the flashlights sold at all three stores. ($115)
2. The charges for hiring a car from three different companies, based on the number of days for which a car is hired and/or the number of kilometers for which the car is driven are as follows: John needs to hire a car for 4 days to drive 560 kilometers. Company A charges $66 per day. Company B charges 48 cents on per kilometer driven. Company C charges $30 per day and 25 cents on per kilometer driven
   1. Write down two matrices only such that the elements of their product under matrix multiplication give the charge of hiring a car from the three different companies.
   2. Find this product. Hence state the company that John should hire the car from in order to save cost
3. A business makes toy buses and toy lorries. The following table is used in calculating the cost of manufacturing each toy.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Labour (Hours) | Wood (Blocks) | Paint (Tins) |
| Bus | 6 | 4 | 3 |
| Lorry | 3 | 4 | 2 |

Labour costs $8 per hour, wood costs $1 per block and paint costs $2 per tin.

It is given that  and .

1. Evaluate C and explain what the numbers in your answer represent in complete sentences.
2. In addition, .Evaluate DC and explain what your answer represents.