The next two questions are based on the following information.   
  
Jane wants to setup a photo shop. The cost to rent an office is $150 per week. The variable cost of making one photo is $20 and she can sell it for $50.

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| |  |  | | --- | --- | | Question 1 of 2 | 5.0 Points |  |  | | --- | |  |   **Jane has to sell photos per week to break even. (Please only enter an integer and include no units.)**   |  |  | | --- | --- | | Question 2 of 2 | 5.0 Points |  |  | | --- | |  |   **If Jane sells 10 units, her profits would be dollars. (Please only enter an integer and include no units.)**  The next two questions are based on the following information.   Paul wants to choose one of the two investment opportunities over three possible scenarios. Investment 1 will yield a return of $10,000 in Scenario 1, $2,000 in Scenario 2, and a negative return of -$5,000 in Scenario 3. Investment 2 will yield a return of $6,000 in Scenario 1, $4,000 in Scenario 2, and zero in Scenario 3. The probability for Scenario 1 is 0.2, for Scenario 2 is 0.3, and for Scenario 3 is 0.5.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | Question 1 of 2 | 5.0 Points |   **If you were to choose the investment that maximizes Paul's Expected Money Value (EMV), then you should choose \_\_\_\_\_\_\_\_\_\_.**   |  | | --- | |  |  |  |  |  |  | | --- | --- | --- | --- | | |  | | --- | |  | | A. Investment 1 |  | | |  | | --- | |  | | B. Investment 2 |  | | |  | | --- | |  | | C. Indifferent |  | | | |
| Question 2 of 2 | 5.0 Points |

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**If Paul is uncertain about the return for Investment 1 in Scenario 1, then this return has to be dollars in order to make Paul indifferent between these two investments (i.e. the two investments would have the same EMV.) (Please only enter an integer and include no units.)**

The next three questions are based on the following information.   
  
Sam has a cleaning service. To better allocate his resources, he would like to forecast his weekly orders based on the order number he received in the past 13 weeks as shown in the following table.

|  |  |
| --- | --- |
| Week | Demand |
| Week 1 | 11 |
| Week 2 | 14 |
| Week 3 | 16 |
| Week 4 | 10 |
| Week 5 | 15 |
| Week 6 | 17 |
| Week 7 | 11 |
| Week 8 | 14 |
| Week 9 | 17 |
| Week 10 | 12 |
| Week 11 | 14 |
| Week 12 | 16 |
| Week 13 | 15 |

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| |  |  | | --- | --- | | Question 1 of 3 | 5.0 Points |  |  | | --- | |  |   **Using a three week moving average, Sam's forecast for his Week 14 order number is . (Please round to two decimal points and include no units.)** |

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| Question 2 of 3 | 5.0 Points |

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**Using a three week weighted moving average with weights 3, 2, and 1 given to the most recent, second most recent, and third most recent week, respectively, Sam's forecast for his Week 14 order number is . (Please round to two decimal points and include no units.)**

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| Question 3 of 3 | 5.0 Points |

**If the MAD for moving average is 4.17 and the MAD for weighted moving average is 2.38, then which forecast is more accurate?**

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| --- | --- | --- | --- |
| |  | | --- | |  | | A. Moving average |  |
| |  | | --- | |  | | B. Weighted moving average |  |
| |  | | --- | |  | | C. The same |  |
| |  | | --- | |  | | D. Not enough information to evaluate. |  |

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| Part 4 of 8 - Part 4 |

The next three questions are based on the following information.   
  
A grocery store needs to sell 3,000 cartons of 2L 2% milk per month. The sales is relatively constant throughout the month. The owner of this grocery store purchases milk from a supplier 50 miles away for $2 per carton, and it takes a day to restock. The holding cost per carton per month is $1.5, and the ordering cost per order is about $18.5 including labor, gas and depreciation. Consider a month of 30 days.

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| |  |  | | --- | --- | | Question 1 of 3 | 5.0 Points |  |  | | --- | |  |   **The optimal order quantity is about cartons of milk, and the average inventory is about cartons. (Please round to the closest integer and include no units.)** |

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| Question 2 of 3 | 5.0 Points |

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**Given the optimal order quantity calculated above, if the average inventory is 136 cartons, then the monthly holding cost is dollars, and the total cost including the cost of supply, holding and ordering is dollars. (Please round to two decimal points and include no units.)**

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| Question 3 of 3 | 3.0 Points |

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**The reorder point is cartons. (Please only enter an integer and include no units.)**

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| Part 5 of 8 - Part 5 |

The next two questions are based on the following information.   
  
A cafeteria wants to introduce a new burger, with bread and beef together weighing at least 1 ounce. The cafeteria manage also wants the new burger to meet a new nutrition standard, i.e. contains at least 7 units of Vitamin A and 10 units of Vitamin B. Each ounce of beef contains 1 unit Vitamin A and 6 units of Vitamin B, while each ounce of bread contains 2 units Vitamin A and 1 units of Vitamin B. The price of beef is $0.5 per ounce and the price of bread is $0.1 per ounce.

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| |  |  | | --- | --- | | Question 1 of 2 | 5.0 Points |  |  | | --- | |  |   **To minimize the cost, the cafeteria should use ounces of beef and ounces of bread to make the new burger. (Please round to two decimal points and include no units.)** |

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| Question 2 of 2 | 5.0 Points |

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**If the cafeteria uses 1.18 ounces of beef and 2.91 ounces of bread to make the new burger, the total cost of the new burger (excluding other ingredients) is dollars, (Please round to two decimal points and include no units.) and the content of Vitamin A is while that for Vitamin B is . (Please round to the closest integer and include no units for the last two answers.)**

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| Part 7 of 8 - Part 7 |

The next four questions are based on the following information. At a car wash station, on average, there are 4 cars coming in for the service every 10 minutes. The average wash time is 2 minutes. The Poisson distribution is appropriate for the arrival rate and service times are exponentially distributed. Please convert all rates into cars per hour and answer the following questions.

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| |  |  | | --- | --- | | Question 1 of 4 | 5.0 Points |  |  | | --- | |  |   **The average time a car spent in the waiting line is hours, and the total time a car spent in this car wash station is hour. (Please round to two decimal points and include no units.)** |

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| Question 2 of 4 | 3.0 Points |

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**The average number of cars in this car wash station is . (Please round to the closest integer and include no units.)**

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| Question 3 of 4 | 5.0 Points |

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**The probability that there are no cars in this station is . (Please round to one decimal points and include no units.)**

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| Question 4 of 4 | 5.0 Points |

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**The probability that there are exactly two cars in this station is . (Please round to three decimal points and include no units.)**

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| Part 8 of 8 - Part 8 |

The next three questions are based on the following information.   
  
To study the weight accuracy of a 50lb fertilizer bag, 12 samples of 12 bags of fertilizer in each sample were taken and the results are as follows.

|  |  |  |
| --- | --- | --- |
|  | Mean | Range |
| Sample 1 | 47 | 1.1 |
| Sample 2 | 46 | 1.31 |
| Sample 3 | 46 | 0.91 |
| Sample 4 | 47 | 1.1 |
| Sample 5 | 48 | 1.21 |
| Sample 6 | 50 | 0.82 |
| Sample 7 | 49 | 0.86 |
| Sample 8 | 49 | 1.11 |
| Sample 9 | 51 | 1.12 |
| Sample 10 | 52 | 0.99 |
| Sample 11 | 50 | 0.86 |
| Sample 12 | 51 | 1.2 |

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| |  |  | | --- | --- | | Question 1 of 3 | 5.0 Points |  |  | | --- | |  |   **The overall average weight of a bag of fertilizer is pound, and the average range is pound. (Please round to two decimal points and include no units.)** |

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| Question 2 of 3 | 5.0 Points |

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**The upper control limit for a 99.7% control chart for the mean is pound, and the lower control limit is pound. (Please round to two decimal points and include no units. Please enter the upper limit first.)**

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| Question 3 of 3 | 5.0 Points |

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**The upper control limit for a 99.7% control chart for the range is pound, and the lower control limit is pound. (Please round to two decimal points and include no units. Please enter the upper limit first.)**