

**Chapter 6 HW**

**Question 1**

1. A major U.S. automaker has determined that the city mileage for one of its new SUV models is normally distributed with a mean equal to 15.2 mpg. A report issued by the company indicated that 22 percent of the SUV model vehicles will get more than 17 mpg in the city. Given this information, what is the city mileage standard deviation for this SUV model?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 0.77 mpg |
|  |  | Approximately 2.34 mpg |
|  |  | 1.8 mpg |
|  |  | Approximately 3.1 mpg |

1 points

**Question 2**

1. A major cell phone service provider has determined that the number of minutes that its customers use their phone per month is normally distributed with a mean equal to 445.5 minutes with a standard deviation equal to 177.8 minutes. As a promotion, the company plans to hold a drawing to give away one free vacation to Hawaii for a customer who uses between 400 and 402 minutes during a particular month. Based on the information provided, what proportion of the company's customers would be eligible for the drawing?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Approximately 0.1026 |
|  |  | About 0.004 |
|  |  | Approximately 0.2013 |
|  |  | About 0.02 |

1 points

**Question 3**

1. A major cell phone service provider has determined that the number of minutes that its customers use their phone per month is normally distributed with a mean equal to 445.5 minutes with a standard deviation equal to 177.8 minutes. The company is thinking of changing its fee structure so that anyone who uses the phone less than 250 minutes during a given month will pay a reduced monthly fee. Based on the available information, what percentage of current customers would be eligible for the reduced fee?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | About 36.4 percent |
|  |  | Approximately 52 percent |
|  |  | About 86.6 percent |
|  |  | About 13.6 percent |

1 points

**Question 4**

1. A major cell phone service provider has determined that the number of minutes that its customers use their phone per month is normally distributed with a mean equal to 445.5 minutes with a standard deviation equal to 177.8 minutes. The company is thinking of charging a lower rate for customers who use the phone less than a specified amount. If it wishes to give the rate reduction to no more than 12 percent of its customers, what should the cut-off be?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | About 237 minutes |
|  |  | About 654 minutes |
|  |  | About 390 minutes |
|  |  | About 325 minutes |

1 points

**Question 5**

1. A professor noted that the grades of his students were normally distributed with a mean of 75.07 and a standard deviation of 11.65. If only 10 percent of the students received grades of A, what is the minimum score needed to receive an A?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 80.00 |
|  |  | 85.00 |
|  |  | 90.00 |
|  |  | 95.00 |

1 points

**Question 6**

1. A recent study showed that the length of time that juries deliberate on a verdict for civil trials is normally distributed with a mean equal to 12.56 hours with a standard deviation of 6.7 hours. Given this information, what is the probability that a deliberation will last between 10 and 15 hours?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Approximately 0.29 |
|  |  | Nearly 0.75 |
|  |  | About 0.48 |
|  |  | About 0.68 |

1 points

**Question 7**

1. Employees at a large computer company earn sick leave in one-minute increments depending on how many hours per month they work. They can then use the sick leave time any time throughout the year. Any unused time goes into a sick bank account that they or other employees can use in the case of emergencies. The human resources department has determined that the amount of unused sick time for individual employees is uniformly distributed between 0 and 480 minutes. Based on this information, what is the probability that an employee will have less than 20 minutes of unused sick time?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 0.002 |
|  |  | 0.966 |
|  |  | 0.063 |
|  |  | 0.042 |

1 points

**Question 8**

1. Employees at a large computer company earn sick leave in one-minute increments depending on how many hours per month they work. They can then use the sick leave time any time throughout the year. Any unused time goes into a sick bank account that they or other employees can use in the case of emergencies. The human resources department has determined that the amount of unused sick time for individual employees is uniformly distributed between 0 and 480 minutes. Based on this information, what is the probability that three randomly chosen employees have over 400 unused sick minutes at the end of the year?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 0.1667 |
|  |  | 0.0046 |
|  |  | 0.5001 |
|  |  | 0.0300 |

1 points

**Question 9**

1. Employees at a large computer company earn sick leave in one-minute increments depending on how many hours per month they work. They can then use the sick leave time any time throughout the year. Any unused time goes into a sick bank account that they or other employees can use in the case of emergencies. The human resources department has determined that the amount of unused sick time for individual employees is uniformly distributed between 0 and 480 minutes. The company has decided to give a cash payment to any employee that returns over 400 minutes of sick leave at the end of the year. What percentage of employees could expect a cash payment?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 16.67 percent |
|  |  | 0.1667 percent |
|  |  | Just over 43 percent |
|  |  | 80 percent |

1 points

**Question 10**

1. Employees at a large computer company earn sick leave in one-minute increments depending on how many hours per month they work. They can then use the sick leave time any time throughout the year. Any unused time goes into a sick bank account that they or other employees can use in the case of emergencies. The human resources department has determined that the amount of unused sick time for individual employees is uniformly distributed between 0 and 480 minutes. The company has decided to give a cash payment to any employee that returns over a specified amount of sick leave minutes. Assuming that the company wishes no more than 5 percent of all employees to get a cash payment, what should the required number of minutes be?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 24 minutes |
|  |  | 419 minutes |
|  |  | 456 minutes |
|  |  | 470 minutes |

1 points

**Question 11**

1. It is assumed that the time customers spend in a record store is uniformly distributed between 3 and 12 minutes. Based on this information, what is the probability that a customer will be exactly 7.50 minutes in the record store?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 0.1250 |
|  |  | 0.05 |
|  |  | Essentially zero |
|  |  | 0.111 |

1 points

**Question 12**

1. It is assumed that the time customers spend in a record store is uniformly distributed between 3 and 12 minutes. Based on this information, what is the probability that a customer will spend more than 9 minutes in the record store?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 0.33 |
|  |  | 0.1111 |
|  |  | 0.67 |
|  |  | 0.25 |

1 points

**Question 13**

1. It is assumed that the time failures for an electronic component are exponentially distributed with a mean of 50 hours between consecutive failures. Based on this information, what is the probability that a randomly selected part will fail in less than 10 hours?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | About 0.82 |
|  |  | About 0.20 |
|  |  | About 0.33 |
|  |  | About 0.18 |

1 points

**Question 14**

1. It is assumed that the time failures for an electronic component are exponentially distributed with a mean of 50 hours between consecutive failures. If one extra component is installed as a backup, what is the probability of at least one of the two components working for at least 60 hours?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | About 0.51 |
|  |  | About 0.09 |
|  |  | About 0.06 |
|  |  | About 0.70 |

1 points

**Question 15**

1. It is assumed that the time failures for an electronic component are exponentially distributed with a mean of 50 hours between consecutive failures. What is the probability that a component will be functioning after 60 hours?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Approximately 0.30 |
|  |  | About 0.70 |
|  |  | About 0.21 |
|  |  | About 0.49 |

1 points

**Question 16**

1. It is thought that the time between customer arrivals at a fast food business is exponentially distributed with equal to 5 customers per hour. Given this information, what is the mean time between arrivals?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 12 minutes |
|  |  | 5 minutes |
|  |  | 5 hours |
|  |  | 2 minutes |

1 points

**Question 17**

1. Students who have completed a speed reading course have reading speeds that are normally distributed with a mean of 950 words per minute and a standard deviation equal to 220 words per minute. Based on this information, what is the probability of a student reading at more than 1400 words per minute after finishing the course?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 0.0202 |
|  |  | 0.5207 |
|  |  | 0.4798 |
|  |  | 0.9798 |

1 points

**Question 18**

1. Students who have completed a speed reading course have reading speeds that are normally distributed with a mean of 950 words per minute and a standard deviation equal to 220 words per minute. If two students were selected at random, what is the probability that they would both read at less than 400 words per minute?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 0.4938 |
|  |  | 0.0062 |
|  |  | 0.00004 |
|  |  | 0.2438 |

1 points

**Question 19**

1. Suppose that it is believed that investor returns on equity investments at a particular brokerage house are normally distributed with a mean of 9 percent and a standard deviation equal to 3.2 percent. What percent of investors at this brokerage hour earned at least 5 percent?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 89.44 percent |
|  |  | 10.56 percent |
|  |  | 39.44 percent |
|  |  | 100 percent |

1 points

**Question 20**

1. The makers of Sweet-Things candy sell their candy by the box. Based on company policy, the mean target weight of all boxes is 2.0 pounds. To make sure that they are not putting too much in the boxes, the manager wants no more than 3 percent of all boxes to contain more than 2.10 pounds of candy. In order to do this, what should the mean fill weight be set to if the fill standard deviation is 0.13 pounds? Assume that the box weights are normally distributed.

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Just over 2 pounds |
|  |  | Approximately 2.33 pounds |
|  |  | Nearly 1.27 pounds |
|  |  | Approximately 1.86 pounds |

1 points

**Question 21**

1. The makers of Sweet-Things candy sell their candy by the box. Based on company policy, the mean target weight of all boxes is 2.0 pounds. To make sure that they are not putting too much in the boxes, the manager wants no more than 3 percent of all boxes to contain more than 2.10 pounds of candy. In order to do this, with a mean weight of 2 pounds, what must the standard deviation be? Assume that the box weights are normally distributed.

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Approximately 0.05 pounds |
|  |  | -0.133 pounds |
|  |  | 1.144 pounds |
|  |  | None of these. |

1 points

**Question 22**

1. The manager at a local movie theater has collected data for a long period of time and has concluded that the revenue from concession sales during the first show each evening is normally distributed with a mean equal to $336.25 and a standard deviation equal to $80. Based on this information, what are the chances that the revenue on the first show will be between $300 and $500?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | About 0.3062 |
|  |  | Approximately 0.6534 |
|  |  | 0.1736 |
|  |  | Approximately 0.4798 |

1 points

**Question 23**

1. The manager at a local movie theater has collected data for a long period of time and has concluded that the revenue from concession sales during the first show each evening is normally distributed with a mean equal to $336.25 and a variance equal to 1,456. Based on this information, what are the chances that the revenue on the first show will exceed $800?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 0.1255 |
|  |  | Essentially zero |
|  |  | 0.3745 |
|  |  | 0.9999 |

1 points

**Question 24**

1. The manager of a computer help desk operation has collected enough data to conclude that the distribution of time per call is normally distributed with a mean equal to 8.21 minutes and a standard deviation of 2.14 minutes. The manager has decided to have a signal system attached to the phone so that after a certain period of time, a sound will occur on her employees' phone if she exceeds the time limit. The manager wants to set the time limit at a level such that it will sound on only 8 percent of all calls. The time limit should be:

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 10.35 minutes. |
|  |  | approximately 5.19 minutes. |
|  |  | about 14.58 minutes. |
|  |  | about 11.23 minutes. |

1 points

**Question 25**

1. The manager of a computer help desk operation has collected enough data to conclude that the distribution of time per call is normally distributed with a mean equal to 8.21 minutes and a standard deviation of 2.14 minutes. What is the probability that three randomly monitored calls will each be completed in 4 minutes or less?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 0.4756 |
|  |  | Approximately 0.1076 |
|  |  | About 0.00001 |
|  |  | Can't be determined without more information. |

1 points

**Question 26**

1. The time between calls to an emergency 911-call center is exponentially distributed with a mean time between calls of 645 seconds. Based on this information, what is the probability that the time between the next two calls is between 200 and 400 seconds?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Approximately 0.47 |
|  |  | About 0.199 |
|  |  | About 0.747 |
|  |  | About 0.801 |

1 points

**Question 27**

1. The transportation manager for the State of New Jersey has determined that the time between arrivals at a toll booth on the state's turnpike is exponentially distributed with = 4 cars per minute. Based on this information, the probability that it will take exactly 30 seconds between arrivals is:

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 0.0006 |
|  |  | 0 |
|  |  | 0.9994 |
|  |  | 0.25 |

1 points

**Question 28**

1. The transportation manager for the State of New Jersey has determined that the time between arrivals at a toll booth on the state's turnpike is exponentially distributed with = 4 cars per minute. Based on this information, what is the probability that the time between any two cars arriving will be less than half a minute?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Approximately 1.0 |
|  |  | Approximately 0 |
|  |  | about 0.86 |
|  |  | About 0.75 |

1 points

**Question 29**

1. Which of the following is not a characteristic of the normal distribution?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Symmetric |
|  |  | Mean=median=mode |
|  |  | Bell-shaped |
|  |  | Equal probabilities at all values of x |

1 points

**Question 30**

1. Which of the following probability distributions would most likely be used to describe the time between failures for electronic components?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Binomial distribution |
|  |  | Exponential distribution |
|  |  | Uniform distribution |
|  |  | Normal distribution |

