Test #1 (9/23/2023)

1. Average cost per item from x = 200 to x = 700. Need C(200)=11,000 and C(700)=14,000. per item
2. This is a two-part question
   1. For y = 65,000 on the graph of C(x), what is x? Answer: From the graph, we can approximate that x = 2,200 items. Or we can solve for x:

1. To find the break-even point between two functions we need the point of intersection between the two lines. (Given a graph we look for the coordinates where the two lines intersect.)

Answer: (if we use the points (0,0) and (2500,60000) we can determine the revenue equation) So the break-even point is the solution to:

Answer from graph: The two lines intersect approximately x = 3450 (3400 would also be an acceptable answer).

1. This is a two-part question
   1. Write an equation from the given information. In 2012, x = 0. We have two points: The equation will be and we know that .

So, all we need is .

Answer to a:

* 1. means the furniture will depreciate by -2300 every year. Starting with 37100 in 2015, we can make a table:

|  |  |  |
| --- | --- | --- |
| x | y |  |
| 2016 | 37100-2300 | 34800 |
| 2017 | 34800-2300 | 32500 |
| 2018 | 32500-2300 | 30200 |
| 2019 | 30200-2300 | 27900 |

Since the value is $30,200 in 2018, and $27,900 in 2019 the value falls below $28K sometime in 2019 (best guess).

1. This is a two-part question
   1. A graph with numbers and lines

      Description automatically generated(see graph) supply is the line starting at (0, 200); demand is the line starting at (0, 950)
   2. the equilibrium between supply and demand occurs when production quantity (x) is 150 and price is $650.
2. This is a two-part question
   1. The equation is where x is hours watched; y is number of sit-ups. For x = 19, we have ; prediction is 9 sit-ups
   2. If no TV, x = 0. So, 23.85 is rounded up to 24 sit-ups
3. The range of a function is the interval for y on x in [0, 192]. Calculate the y values for each of these x: and which gives us the range everything in between:
4. This is a two-part question
   1. f(5) = 93
   2. x = 3
5. Domain of the function is or as an interval:

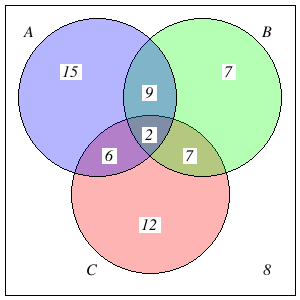
Range of the function is or as an interval

1. Equation of the line is
2. Solution to the system of equations: or

Test #3 (November 20, 2023)

For questions 1, 2, and 3: Let be the universal set, where:  
 and be subsets of , where: Set   
Set





1. means inside A, B, outside C. There are 3 numbers.
2. ***\_\_\_\_\_\_ people were surveyed*** asking whether they watch movies at home from Netflix, Redbox, or a video store. Use the results to determine how many people were surveyed.

|  |  |
| --- | --- |
| 17 only use Netflix | 12 only use Redbox |
| 15 only use a video store | 20 use **only** a video store and Redbox |
| 31 use **only** Netflix and Redbox | 27 use ***both*** a video store and Netflix |
| 19 use all three | 13 use none of these |

A diagram of a company

Description automatically generated

This diagram shows where the numbers go. The tricky one was 8 = 27 – 19 between Netflix and video store. The number of people surveyed was:

135

1. A group of people were asked if they had used an illegal substance last year. 152 responded "yes", and 361 responded "no".  
     
   Find the probability that if a person is chosen at random, they have used an illegal substance in the last year.

Answer:

For 8 and 9: Giving a test to a group of students, the grades and class section are summarized below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | Total |
| Morning | 12 | 9 | 18 | 39 |
| Afternoon | 5 | 15 | 12 | 32 |
| Total | 17 | 24 | 30 | 71 |

If one student was chosen at random, find the probability that the student was in the afternoon class.

1. Probability a student is in the afternoon class =
2. Probability a student is in the morning class, given that they got a ‘C’ =
3. Ilya buys a bag of cookies that contains 8 chocolate chip cookies, 5 peanut butter cookies, 2 sugar cookies and 7 oatmeal cookies.  
     
   What is the probability that Ilya reaches in the bag to get 2 cookies and randomly selects a chocolate chip cookie and a peanut butter cookie from the bag?

Probability =

|  |  |  |  |
| --- | --- | --- | --- |
|  | Tests positive | Tests negative | Row Totals |
| Has disease | 4.8 | 3.2 | 8 |
| Does not have disease | 1.84 | 90.16 | 92 |
| Column Totals | 6.64 | 93.36 | 100 |

1. This table shows the presence of flu in the general population. It also shows how accurate a certain flu test is.

Percent of population with the flu is 8%.

1. This table shows the presence of flu in the general population. It also shows how accurate a certain flu test is.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Tests positive | Tests negative | Row Totals |
| Has disease | 3.2 | 4.8 | 8 |
| Does not have disease | 1.84 | 90.16 | 92 |
| Column Totals | 5.04 | 94.96 | 100 |

The question asks what is the probability that a person has the disease given that they test negative?

Answer: which rounds to 0.051

1. A company estimates that ***7% of their products will fail*** after the original warranty period but within 2 years of the purchase, with a replacement cost of $550.  
     
   If they offer a 2-year extended warranty for $39, what is the company’s expected value of each warranty sold? Let “x” be the profit or loss to the company for each extended warranty sold.

|  |  |  |
| --- | --- | --- |
| x | Pr(x) |  |
| 39 | 0.93 | 36.27 |
| -511 | 0.07 | -35.77 |

Q: What is the expected value?

A:

1. Surab offers the following game. A standard deck of cards is placed face down on the table. The player pays $1.00 to see the top card. If it is a face card the player gets $4.00 in return. If not, the player receives nothing. What can Surab expect to make each time someone plays (over time)?

|  |  |  |
| --- | --- | --- |
| x | Pr(x) |  |
| +1 | 0.7692 | 0.7692 |
| -3 | 0.2308 | -0.6924 |

Expected Value =

1. The total cost function is .

Avg cost from x = 25 to x = 100 is

1. Find the slope of the line through the points (4, 16) and (4.01, 16.081) on the graph of . Use that answer to estimate the slope of the tangent line at (4, 16).

slope =

slope of tangent line is probably 8

1. The following image of a function and the tangent line at x = 4 is shown.

A graph with a line and a dotted line

Description automatically generated

What is the rate of change of y with respect to x (on the curve) at x = 4?

Answer: calculate the slope of the line that passes through (4, 20) and (9, 0).

slope =