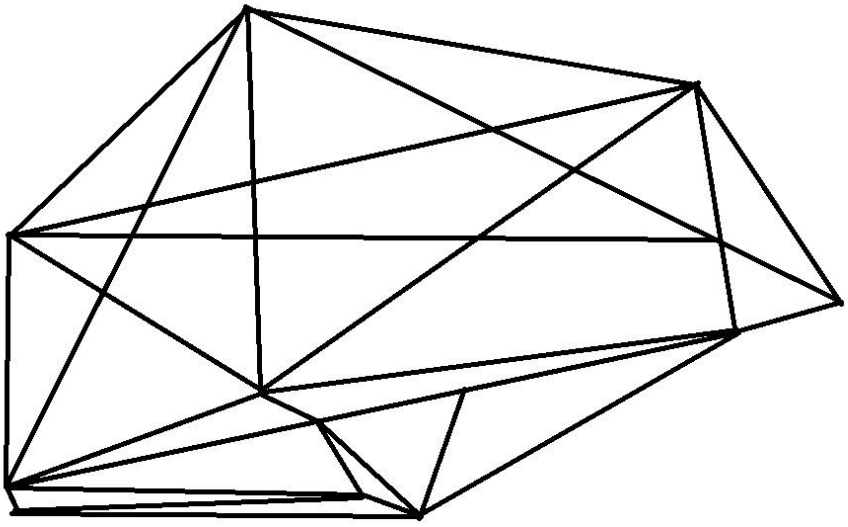
Week #1 Fall 2019

Problem of the Week Solution



How many triangles?

Solution: 65

Week #2 Fall 2019

Problem of the Week Solution

Hank needs sugar for a recipe, but the recipe states that he is to put one cup of sugar into a bowl, then remove ½ a cup from the sugar that is now in the bowl, he is then to add 1/3 of a cup of sugar, followed by removing ¼ of a cup of sugar, adding 1/5 of a cup of sugar, and removing 1/6 of a cup of sugar,… forever. Unable to figure out exactly how much sugar he needs, Hank decides to purchase the largest amount of sugar that will ever be in the bowl. What is this largest amount?

Solution: 1 cup

Week #3 Fall 2019

Problem of the Week Solution

One gallon of paint can cover up to 400 square feet of wall space. If a quantity of paint is stored in a cylindrical can whose base diameter is equal to its height, how much paint would the can hold if there is exactly enough paint in the can to paint the exterior of the can? (You may assume that the material of the can has no thickness).

Solution: The radius will be .001002608 feet so the can will hold .000000006 cubic feet of paint.

Week #4 Fall 2019

Problem of the Week Solution

Hector has decided to take a walk. He starts by heading 1 foot north, but after walking just one foot, he turns right and starts using the following formula: At each turn, he will walk 2/3 of the distance he has travelled so far. So for example, he will walk 1 foot north, then 2/3 of a foot east, then 10/9 feet south,… Each time he will turn right and walk a distance which is 2/3 the distance he has travelled thus far. He has decided to continue walking in this fashion until he either walks over ground that he has already walked over, or until he has walked a total of 1 mile. How far will he be from his original starting point when he ends his walk (as the crow flies)?

Solution: 1523.27357 feet

Week #5 Fall 2019

Problem of the Week Solution

Pass the Pigs is a game where players roll two rubber pigs like dice. If the pig lands so that it is resting on its snout and ear, it is referred to as a leaning jowler. The probability of rolling a leaning jowler when rolling just one pig is 1%. If you roll both pigs together 500 times, what is the probability that you roll at least one double leaning jowler (a double leaning jowler means that both pigs land so that they rest on their snout and ear)?

Solution: 4.877%

Week #6 Fall 2019

Problem of the Week Solution

You have a block of cheese that needs to be cut into smaller pieces for a party. The block measures 3 inches by 2 inches by 5 inches. The block should be cut into 30 pieces (all with equal weight). Each time the blade cuts through the cheese, there is a cross sectional shape whose area contributes to the dulling of the blade. For example, if the block is cut in half (the short way), the cross sectional shape would be a rectangle of 2 inches by 3 inches. If the block was instead cut along the length of the block, the cross section would be a rectangle of 5 inches by 2 inches or 5 inches by 3 inches. How could the block of cheese be cut into 30 equally weighted pieces with the smallest total cross sectional area (the sum of all cross sectional areas from all cuts)?

Solution: By cutting it 4 times on one side, 2 times on a second side and 1 time on the last side, you will only cut across 59 square inches of cross sectional area.

Week #7 Fall 2019

Problem of the Week Solution

Rachel has a wall that she would like to cover with wallpaper. The wall measures 90 inches by 120 inches. She has been given a box of wallpaper that has an assortment of pieces. There is a 1 inch by 1 inch piece, a 2 inch by 2 inch piece, a 3 inch by 3 inch piece,… The box contains all square pieces, there is one piece of each size, and the dimensions of each piece are whole numbers (in inches). The largest size is 90 inches by 90 inches. Rachel would like to cover the wall without cutting any of the pieces and with as little overlap as possible. Is it possible to cover the walls? If so, what is the smallest amount of wallpaper (area) that can be used to cover the entire wall?

Solution: By using the 90x90, 31x31, 30x30, 16x16, 15x15, 14x14, 13x13, 5x5, 4x4, 3x3, 2x2, 1x1, you only have 62 square inches more than needed.

Week #8 Fall 2019

Problem of the Week Solution

Maurice had several customers in his tattoo parlor today, each of which requested a simple tattoo of their astrological sign. Match each customer to their zodiac sign and tattoo color, and determine the price for each using the following clues:

1. Laura was either the person who got the orange tattoo or the Libra.

2. The person who paid $65 wasn't the Gemini.

3. Of the person who got the violet tattoo and the Pisces, one paid $35 and the other was Yolanda.

4. Laura paid 10 dollars more than the person who got the red tattoo.

5. Mario was either the Pisces or the customer who got the blue tattoo.

6. The person who got the black tattoo was either the Libra or the customer who paid $40.

7. Yolanda paid 10 dollars more than the Cancer.

8. The customer who got the green tattoo paid 10 dollars less than Mario.

9. Of the customer who got the black tattoo and the Sagittarius, one paid $40 and the other was Yolanda.

10. The Taurus paid 20 dollars more than Wilma.

11. Mario paid 10 dollars less than Bonita.

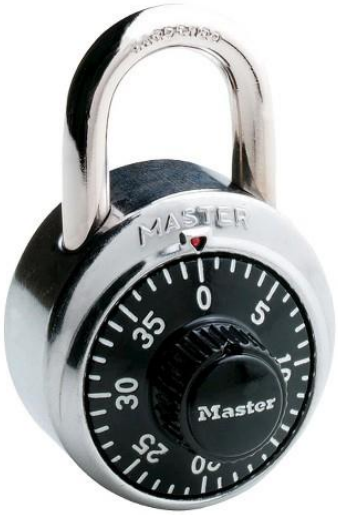
12. Oscar was either the customer who paid $55 or the Aquarius.

13. The Aquarius paid more than the Taurus.

Price	Color	Sign	Name
35	Green	Pisces	Wilma
40	Black	Cancer	Philip
45	Blue	Gemini	Mario
50	Violet	Sagittarius	Yolanda
55	Red	Taurus	Bonita
60	Orange	Aquarius	Oscar
65	Pink	Libra	Laura

Week #9 Fall 2019

Problem of the Week Solution

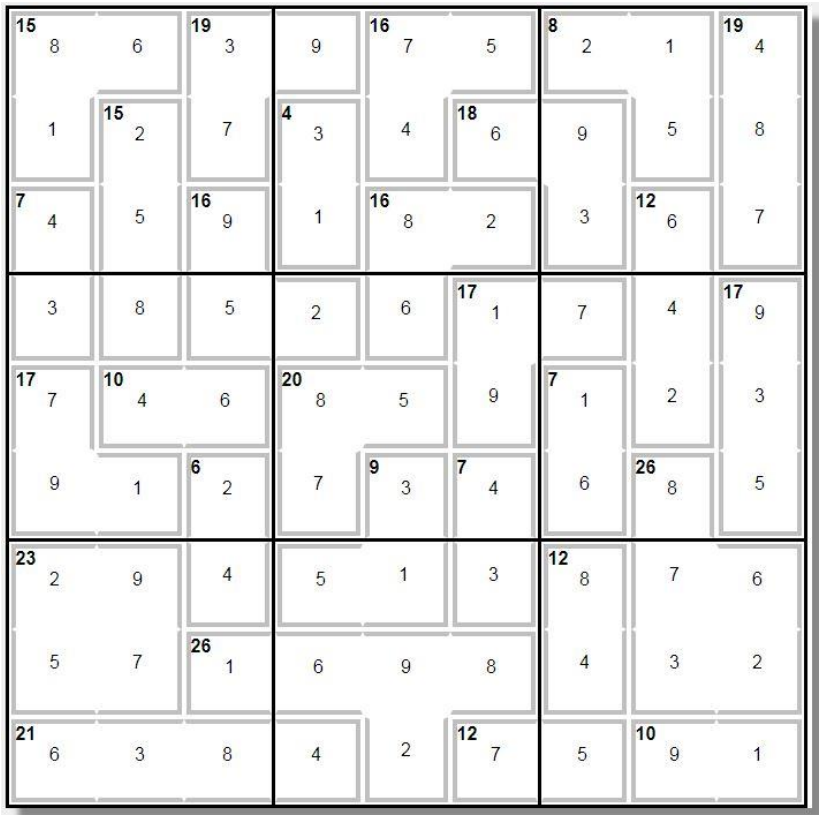


Teddy has two combination locks on his house. The first is a lock with a dial that requires a combination of 3 numbers between 0 and 39. The second lock is cylinder discus lock that requires a combination of 4 numbers between 0 and 9. When writing down the combination, Teddy writes down all 7 numbers in order. Teddy has asked you to retrieve something from his home and has left the full list of all 7 numbers in your mailbox, but four of the numbers are smudged and cannot be read. If you know that Teddy always uses a combination that reads the same forwards as backwards, what is the largest number of combinations you may need to try before successfully opening the locks (at this point you do not know which numbers are smudged)?

Solution: 790 combinations.

Week #10 Fall 2019

Problem of the Week Solution



The puzzle above is a form of Sudoku. Instead of giving the numbers that belong in a selection of cells, the puzzle provides the sum of the numbers in each grouping of cells (the groupings are indicated with gray outlines and the sums of the numbers in the associated cells are indicated in the upper left corners). Solve the puzzle above for this weeks problem.