Team #_____ Round 1 Score_____

1. Belle has read 45 books in a library with 900 books. What is the percentage of books she's read in the library?

Ans: 5%
45/900 = 0.05 = 5%

2. Wall-E cleans 84 cubes of trash per month. How many cubes of trash will Wall-E clean in a year?

Ans: 1008
84 x 12 = 1008

3. Standing on Pride Rock, Mufasa has a visibility of 5 miles in every direction. What is the total area he can see? (Leave your answer in terms of pi)

Ans: 25 pi

Team #_____ Round 2 Score_____

1. Rapunzel is sprinting on her horse Maximus. She is able to cover 30 meters in 5 seconds. How many kilometers will she be able to cover in an hour?

Ans: 21.6
360 meters in 1 min
360 x 60 meter in an hr = 21600
21600 meters - 21.6 km

2. Genie will grant Aladdin one extra wish if he answers a question correctly: "What is one less than the product (18) x (-19)?" What should Aladdin answer?

Ans: -343
18 x -19 = -342
-342 - 1 = -343

3. Mulan's sword case is a rectangular prism that is 5 feet long, 2 feet wide, and has a volume of 20 feet cubed. What is the sum of the lengths of the edges of the sword case (answer in feet)?

Ans: 18

The 3rd dimension side must be 2 feet because 5 x 2 x 2 - 20
Thus, the sum of the edges is 2(2+5+2) = 18

Team #_____ Round 3 Score_____

1. Winnie the Pooh rolls a 4-sided die 4 times. What is the probability he does not get 4 every time, expressed as a fraction?

Ans: 81/256
(¾)^4 = 81/256

2. Merida is shooting at a target. The first circular ring is centered around the bull's eye and has a radius of 3 feet. The second circular ring is also centered around the bull's eye and has a radius of 5 feet. What is the area between the first and second rings? (answer in terms of pi)

Ans: 16 pi
25pi - 9 pi = 16 pi

3. Ariel is buying gadgets and discovers they are discounted to half the price. Later, she finds a coupon that gives an additional 10% discount. Applying the coupon on the half-price sale, what percent of the original gadget price is Ariel paying?

Ans: 45%
.5 x .90 = .45 = 45%

Team #_____ Round 4 Score_____

1. The profit Aladdin's Market makes in one day can be depicted by this polynomial, $p = 6x^2 - 4x + 32$, where P is profit and x represents the number of customers. How much money does Aladdin's Market make if they receive 20 customers in one day?

Ans: 2352
6(20)^2 - 4(20) +32 = 6(400) - 80 + 32
= 2400 - 80 + 32 = 2352

2. In Aurora's bouquet of pink, yellow, and blue flowers, all but 6 are pink flowers, all but 8 are yellow flowers, and all but 4 are blue flowers. How many flowers are in her bouquet?

Ans: 18

Pink = 6

Yellow = 8

Blue = 4

6 + 4 + 8 = 18

3. Sid the sloth is stuck on a rectangular sheet of ice that has a perimeter of 50 ft. The length of the diagonal is 10 ft. What is the area of the sheet of ice?

Ans: 62.5

l + w = 25

l^2 + w^2 = 10^2 = 100

l^2 + 2lw + w^2 = 225

100 + 2lw = 225

2lw = 125

lw = 62.5

You can also solve for l and w but that's more work...

Team #_____ Round 5 Score_____

1. In Arendelle, there are 498 villagers. There are 188 villagers who own a horse and 63 villagers who own a shop. 297 own neither a horse nor a shop. How many villagers own both a horse and a shop?

Ans: 50
188 + 63 +297 = 548

548-498 = 50 (overlap)

2. In Zootopia there are 90 houses each numbered between 10-99. How many of those houses have a number such that the two digits in the number sum to a perfect square?

Ans: 17
Possible sums: 1, 4, 9, 16
Case 1: 10 ↠ 1
Case 4: 13, 22, 31, 40 ↠ 4
Case 9: 18, 27, 36, 45, 54, 63, 72, 81, 90 ↠ 9
Case 16: 79, 88, 97 ↠ 3
1+4+9+3 = 17

3. Pepita, the animal spirit guide in the movie Coco, is flying through the Land of the Dead. Pepita flys at the speed of $(21^2 - 4) / 19$. How fast is Pepita flying?

Ans: 23
Factor the numerator by using difference of squares
(21-2)(21+2)/19 = (19)(23)/19 = 23

Team #_____ Round 6 Score_____

1. A fish tank has a rectangular base that measures 100cm x 400 cm and has a height of 50 cm. The tank is filled with water to a depth of 37 cm. Nemo, a clownfish, is added to the tank and is completely submerged in the water. Nemo has a volume of 1000 cm^3. By how many centimeters does the water level rise in the tank?

Ans: 0.025
Volume displacement ...
1 cm layer = 100 x 400 x 1 = 40000
1000/40000 = 0.025

2. Working in pairs, Tinker Bell and Hank can assemble a gear in 2 hours, Tinker Bell and Bobble can assemble a gear in 3 hours, and Bobble and Hank can do the same job in 4 hours. How many hours will it take for Tinker Bell, Hank, and Bobble if they work together to assemble a gear? Express your answer as a common fraction.

Ans: 24/13

T = tinker bell's work rate (job/hr)

B = bobble's work rate (job/hr)

H = hank's work rate (job/hr)

2t+2b = 1

3t + 3h = 1

4b + 4h = 1

Solve equations for t,b, h .... T = 7/24, b = 5/24, h = 1/24

Together they can complete 13/24 of a job in an hour.... Takes 24/13 hours to assemble gear

3. Woody is trying to sort his toys. When he arranges his toys into piles with 11 toys each, there are 9 toys left over. When he arranges his toys into piles with 9 toys each, there are 8 left over. When he arranges his toys into piles with 10 toys, there are two left over. What's the least possible amount of toys Woody has?

Ans: 152
Smallest number that is 9 mod 11, 8 mod 9, 2 mod 10... i know theres a way to solve this with actual math and modular stuff lol but I forgot and just guessed and checked

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Team #_____ Round 7 Score_____

1. Mulan is firing cannons at the Huns. She has a 25% chance of hitting a Hun on each fire. If she fires the cannon 4 times, what is the probability she'll hit exactly twice? Answer in a fraction in simplest form. (2 points)

Ans: 27/128
Binomial theorem.... 4 chances, 2 success, 25% success rate
(4!)/2!/2! (0.75)^2 (0.25)^2 = 0.2109375 = 27/128

2. Alice finds a chessboard in Wonderland. She randomly chooses two scores on the 8x8 chessboard. What is the probability the two squares she chose share a side?

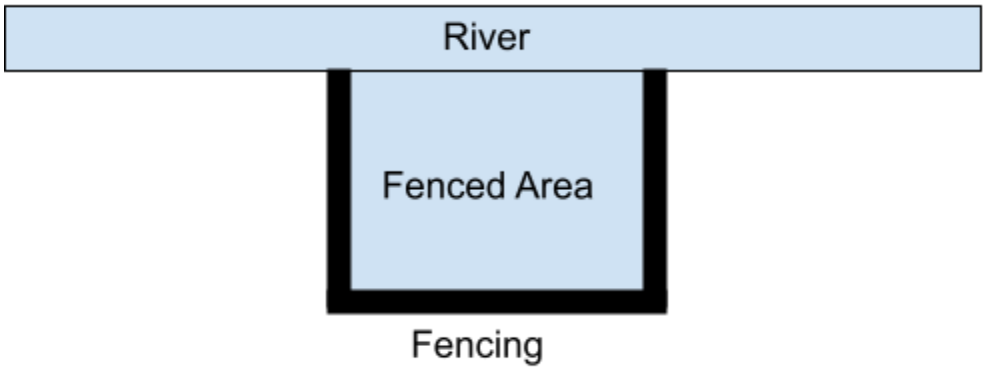
Ans: 1/18
There are 3 types of squares: adjacent to 4 sides (interior), adjacent to 3 sides (edge), and adjacent to two sides (corners)
Case 1: interior = 36 squares
36/64 x 4/63 =
Case 2: edge = 24 squares
24/64 x 3/63 =
Case 3: corner = 4 squares
4/64 x 2/63 =
Sum up case 1,2,3 = 1/18
.

Team #_____ Round 8 Score_____

1. Ralph is trying to break the internet. In order to do so, he must enter a 4-digit passcode. The digits in the passcode are all different. The leading digit is not zero, the passcode is a multiple of 5, and 5 is the largest digit in the passcode. How many possible passcodes are there?

Ans: 84

2. Pocahontas is building a square fenced area for her raccoon Meeko along a river. She wants to make sure the raccoon has 36 ft^2 of land in the fenced area. Since the river encloses one side, Pocahontas only needs to fence 3 sides. What is the minimum amount of fencing required for Pocahontas to create a play area for her Meeko?



Ans: 12 sqrt 3

18 ft --< i don't think so bc the fence parallel to the river should be longer since u only need to cover one side of it