

Remedial Flipped

CMEF 2014

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The Story of FAN X99

- Offered since September 2006
- Designed for students who need to upgrade/refresh their quantitative background in preparation for SFU Q courses. An in-depth look at what mathematics is, mathematical reasoning, problem solving and math study skills. Review of fundamental topics and concepts of mathematics and their real-world applications. Students will develop math study skills and build confidence in their quantitative abilities, and will learn how understanding mathematics is both one of the keys to mastering other disciplines, and useful in everyday situations.

Course Format

- Class meets twice a week, 2 hours each session
- Support through our Q Workshop – a drop-in centre, where students can work together or get help from TAs

In the Classroom







A student getting help from a TA.

A group of students working together.



Handshake Problem

- There are 32 people in class today. If everybody shakes hands with everybody else, what is the total number of handshakes?

Locker Problem

- CF Gauss Senior Secondary had exactly 1000 students. Their lockers, numbered 1 to 1000, lined the main corridor of the school. One day, the students decided to perform the following number theory experiment, using the lockers. The first student opened all the 1000 lockers. The second closed every second locker, starting with the locker #2. The third student visited every third locker, starting with #3, closing all the lockers that were open, and opening all the lockers that were closed. The fourth student started with locker #4, and changed every fourth by closing all the lockers that were open, and opening all the lockers that were closed. They continued in this manner until all students had performed their task: the n -th student started with locker # n , and visited every n -th locker, closing the open ones and opening the closed ones. Which lockers were open after the students finished the experiment?

Darts Problem

- My friend Peter has built a new dartboard for his son. The board has two regions: the centre circle, valued at 9 points, and the outside circle, valued at 4 points. What is the largest number that cannot be achieved as a score in this game? (Assume that you can continue the game as long as you wish, and that you can stop whenever you wish.)

1001 Pennies Problem

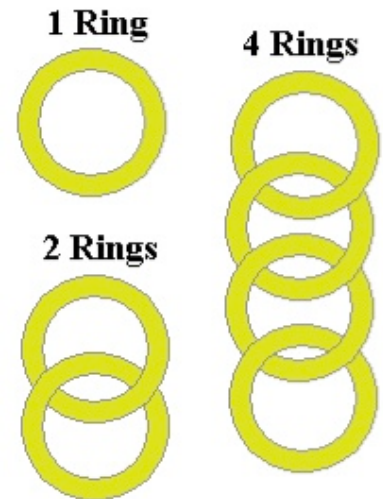
- One thousand and one pennies are arranged in a row on a table. Every second coin is replaced with a nickel. Then every third coin is replaced with a dime. Finally, every fourth coin is replaced with a quarter. What is the total value of coins left on the table?

Slaying the Dragon problem

- Prince Igor has to fight a dragon with three heads and three tails. At each blow, his magic sword can cut off either one or two heads, or either one or two tails of the dragon. But if he cuts off one dragon's head, a new head grows in its place. If he cuts one tail, 2 new tails appear. If he cuts off 2 tails, 1 new head appears. If he cuts off 2 heads, nothing new grows. The dragon dies only if he has no head and no tail. Can Igor win, if he has enough power for no more than 10 blows of the sword.

Golden Rings Problem

You arrive at a hotel and have 3 sets of golden rings. You cannot take these sets of rings apart, exchange them for a different form of currency, and the hotel clerk has no change. You want to stay at the hotel for 7 nights, and you have to pay one gold ring for each night that you stay. You cannot pay in advance, or all at once at the end of your stay. How do you pay for your 7 nights at the hotel?



Amoeba Problem

- An amoeba propagates by a simple division. Each split takes three minutes to complete. When I put such an amoeba into a glass container with a nutrient solution, in one hour the glass is full of amoebas. How long would it take for the glass to be filled if I start with not one amoeba, but two?

Alien Handshake Problem

- You were kidnapped by friendly though somewhat strange looking aliens, and taken to their planet, where you've spent a few weeks observing their customs. Eventually you were returned to Earth, where, it seems, only a few minutes have passed.

The aliens all had three hands, with three fingers on each hand. One of their particularly interesting customs was the way they greeted each other at social gatherings, if three or more aliens were present. Their "handshake" always involved three people, with each of them shaking hands of the other two.

If each three-people "handshake" is counted as one greeting, how many greetings will be in a group of four aliens? Five aliens? Six? Ten? What is the pattern? Is it similar to "human" handshakes?

Airline Passenger Problem

- An airline passenger fell asleep half way to his destination. When he awoke, the distance remaining was half the distance traveled while he slept. How much of the entire trip was he asleep?

King's Last Wish Problem

A young king is mortally wounded in battle. His beloved wife is expecting a baby. The king is afraid that he will not live long enough to see his child, so he calls his court and announces his last will and testament:

- My fortune is to be divided between my wife and the child.
- If a son is born, he should receive two thirds and my wife one third.
- If a daughter is born, then she should receive one third and my wife two thirds of the fortune.

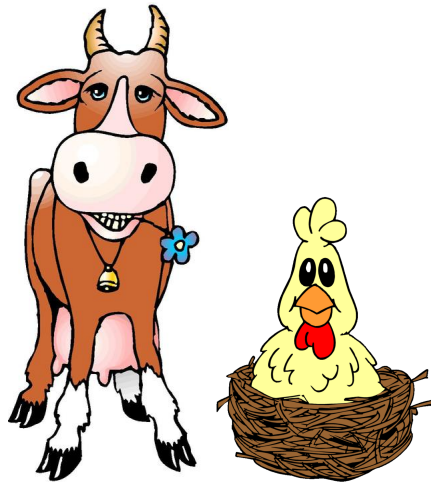
The king dies and his wife has twins, a son and a daughter, a possibility he had not foreseen. How should the king's fortune be divided?

Apples Problem

- Three tired and hungry men had a bag of apples. When they were asleep one of them awoke, ate $\frac{1}{3}$ of the apples and went back to sleep. Later a second man awoke, ate $\frac{1}{3}$ of the remaining apples, and went back to sleep. Finally, the third man awoke and ate $\frac{1}{3}$ of the remaining apples, leaving 8 apples in the bag. How many apples were in the bag originally?

Cows and Hens Problem

In a group of cows and hens, the number of legs was 84 more than twice the number of heads. How many cows were there?



Students Comments

- MATH 100 turned out to be an extremely easy course! Thanks to FAN of course!
- I was so freaked out about taking math again for the first time in almost ten years, but it ended up being one of my favourite classes this semester, and I'm actually excited about taking Math 190 this summer!

More Comments

- For many years there was a Math Curse in my family... and I've finally broken it!
- This was a FANtastic course!

Thought ...

You cannot teach people anything. You can only help them discover it within themselves.

Galileo