No University Professor in Canada can claim such a list of honours. Andy is a demanding, but popular teacher, exactly as he prefers. His respect for students is immense, but he demands that they learn to think, and he does it in a firm and supportive manner. We all benefit by paying attention to the perceptions of a person who has devoted so much thought and energy to the teaching and learning of mathematics. (Jack Mackie)

---

**Math Jokes**

As far as the laws of mathematics refer to reality, they are not certain, and as far as they are certain, they do not refer to reality. Albert Einstein (1879-1955)

I’ve heard that the government wants to put a tax on the mathematically ignorant. Funny, I thought that’s what the lottery was! Gallagher

Young man, in mathematics you don’t understand things, you just get used to them. John von Neumann (1903-1957)

“You do not really understand something unless you can explain it to your grandmother.” Albert Einstein

Life is complex. It has real and imaginary components. Tom Potter

Copernicus’ parents: Copernicus, young man, when are you going to come to terms with the fact that the world does not revolve around you?! Erin Leonard

An astronomer is on an expedition to darkest Africa to observe a total eclipse of the sun, which will only be observable there, when he’s captured by cannibals. The eclipse is due the next day around noon. To gain his freedom he plans to pose as a god and threaten to extinguish the sun if he’s not released, but the timing has to be just right. So, in the few words of the cannibals’ primitive tongue that he knows, he asks his guard what time they plan to kill him.

The guard’s answer is “Tradition has it that captives are to be killed when the sun reaches the highest point in the sky on the day after their capture so that they may be cooked and ready to be served for the evening meal.”

“Great,” the astronomer replies.

The guard continues, though, “But because everyone’s so excited about it, in your case we’re going to wait until after the eclipse.”

Edward Ruden

Statistics are like a bikini - what they reveal is suggestive, but what they conceal is vital. Aaron Levinstein

---

**Math Stories**

Solving Problems can be Fun

Ambikeshwar Sharma

Sometimes simple mathematical problems are put to you at a time and at a place when you least expect them. I believe that it pays to face them and to try to understand them and if possible to solve them. As a student of mathematics it is not fair to refuse to attend to the problem or to pass it off with a contemptuous wave of the hand. This conviction came to me by an event that happened to me several years ago when I was going by an evening overnight train from Lucknow to Allahabad, India.

Later this conviction became all the more strongly entrenched in my mind when I came to Edmonton about 36 years back. Here I met for the first time Prof. Leo Moser who was a simple, courteous and soft spoken person full of anecdotes, humor and problems. Although the department was small and had no separate building to itself, Leo Moser was the centre of activity discussing problems with any one who cared to listen. He had a photographic memory and was an excellent chess player. I learned that he could play chess against 20 or 30 teams of students from different schools at the same time and would win against all of them. In the faculty lounge in the department, he would discuss problems or tell anecdotes to his students. Anyone who came in and wanted to listen was welcome.

One day I heard him talking to a student about Blichfeldt’s Lemma. I had heard about it but I did not know what it was and why it was important. Professor Moser then explained to me how this lemma was proved by an American mathematician, Blichfeldt. It states that if there is a plane region $R$ of any shape with an area more than $n$ units, then it is always possible to translate (i.e., slide without turning) it in such a way that it covers $n+1$ lattice points (with integer coordinates). In particular, he explained by a sketch on the blackboard that for $n=1$, there is a pair of distinct points in the area $R$ that can be translated into two distinct points $A$ and $B$ with coordinates $(x_1, y_1)$ and $(x_2, y_2)$ such that $x_2 - x_1$ and $y_2 - y_1$ are both integers. He explained to me another time how the Hilbert problem of an orchard became ‘the orchard problem.’

Like the Scottish Problem Book of problems in Warsaw (Poland), he had started a book of problems in which visitors and anyone who has a problem could put his problem in black and white. His contacts with people like Martin Gardner, Prof. P. Turán, Prof. P. Erdős, Prof. D.J. Newman and many others brought us the visits
of some of these well known people. Once I showed him a poem called “Song of a Ph.D.,” a parody written on the lines of Gilbert and Sullivan, which I had heard at Cornell. He read the poem and could recite it the next day. I still recall the first stanza, which runs like this:

When I was a kid and went to school,
Arithmetic was taught by rote and rule,
I did long division and I did cube roots,
At the Rule of Three, I was specially astute,
I was so astute at the Rule of Three,
That now I am the holder of a Ph.D.

Professor Moser was very hospitable and the evening parties at his home were always a treat. His passing away at an early age due to a heart attack was a serious blow to the Department. One of his last students Prof. David Klarner is known for his work on Polyominoes.

To return to the circumstance of the event that happened to me in India, when I was working at the University of Lucknow: I wanted to go to Allahabad by the overnight evening train and to consult the University library there during the day and return the next evening back to Lucknow. I could not afford the luxury of a first class or second class ticket and so bought a third class return ticket. I arrived at the railway station half an hour earlier than the scheduled departure time in order to acquire an upper berth (if possible) and at best a comfortable seat away from the tumult and rush of passengers. I decided to take a seat that looked promising but noticed that a gentleman was ambling outside with an eye on his suitcase. He had already occupied the upper berth and had spread his blanket there for the night and so I had to occupy the lower berth.

A few minutes later the gentleman came in and I learned from him that he was a businessman who was going to Allahabad on some business. He had a big store in a fashionable area in Aminabad. I told him that I was a lecturer at the University and taught mathematics. He seemed happy to learn this and asked me if I could solve two questions for him that his son had asked him and that he could not do. I told him that I would give his problems a try and invited him to state them. My companion started telling me the first problem:

**Problem 1.** A man was badly in need of an honest, hard working servant to look after his cows and do all the household work, as his wife was sick and could not manage the job. He was willing to pay him food and lodging and a dollar a day, paid monthly, but the servant must do all the jobs. He confided his problem to a close friend of his who promised to look around and find a good chap. In a few days his friend, a goldsmith by profession, brought him a young sturdy fellow who was willing to do all the work for the salary offered, except that there would be a condition that he wanted the master to accept. The condition required by this servant was that if he decided to leave on a certain day, he must get the exact salary up to that day. If the master were unable to pay the exact amount up to that day, the master would have to pay a severe penalty of losing some body part (nose and ears). Since the man needed a servant badly, he agreed to the terms without much thought. The servant did prove to be excellent and he did all the jobs well without murmur or dissent. But the master began to worry about the terms imposed by the servant and this worry made him sick. He again told his difficulty to his friend, the goldsmith, who asked him to be of good cheer. He asked him to give him $31 and in return he gave him five gold rings, which he was asked to put on his fingers. My companion asked me to tell him the price of each of those golden rings with which he could pay his strange servant if he decided to leave on any day of the next month.

I went over the problem with him again to get some time to think. By this time other passengers were streaming in and our compartment was getting filled up. After a few minutes I was lucky to get the solution for my friend and when I told him the price of each of the five rings, he was happy. His second problem was as follows:

**Problem 2.** Three men with a monkey bought some mangos, but decided to eat the mangos next morning after the night’s sleep. At night one of the men got up and saw that if he gave one mango to the monkey, he could divide the rest of the mangos into three equal groups. He ate his share and gave one mango to the monkey. Later a second person got up and he also noticed that if he gave one mango to the monkey he could divide the remaining mangos into three equal groups. So he ate his share and gave one mango to the monkey. Finally the third man got up and gave one mango to the monkey and ate his share of the mangos and went to sleep. When all of them got up in the morning, they again found that if they gave one mango to the monkey, they could divide the rest equally among themselves. The problem is to determine the smallest possible number of mangos that the men had bought.

The train had now started. My companion insisted that I occupy the upper berth while he would share his lower berth with two others. By the time the train arrived at the next station I was able to announce to my friend that the smallest number of mangos in the second problem was 79. Although we had no pen or paper, I could explain to him how I obtained the solution and he could verify the result. The next morning as the train steamed in at Allahabad, my friend woke me up and we parted as good friends. I was happy to have earned a friend by my effort to solve his problems.

**Problem 3.** If you can find the day of the week from the date of birth of a person, you can make a good impression
in any company and it becomes great fun to demonstrate this to the guests of the evening. This kind of problem is called a Calendar Problem. We recall that the calendar that we use now is the Gregorian Calendar started by the Pope Paul Gregory in 1582 who fixed the days in the year as 365 but that every fourth year would be a leap year except when it is divisible by 400. Thus 1700, 1800, 1900 are not leap years, while 2000 is a leap year. If we keep in mind that the days of the week recur every 7th day, all calculations in calendar problems are based on congruence modulo 7. To give a convenient and easy formula for calculating the day of the week, when a particular date $r$ falls, we make the following conventions:

The days of the week are numbers as follows:

<table>
<thead>
<tr>
<th>Day</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>0</td>
</tr>
<tr>
<td>Monday</td>
<td>1</td>
</tr>
<tr>
<td>Tuesday</td>
<td>2</td>
</tr>
<tr>
<td>Wednesday</td>
<td>3</td>
</tr>
<tr>
<td>Thursday</td>
<td>4</td>
</tr>
<tr>
<td>Friday</td>
<td>5</td>
</tr>
<tr>
<td>Saturday</td>
<td>6</td>
</tr>
</tbody>
</table>

We shall number the months in the following way:

<table>
<thead>
<tr>
<th>Month</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>1</td>
</tr>
<tr>
<td>April</td>
<td>2</td>
</tr>
<tr>
<td>May</td>
<td>3</td>
</tr>
<tr>
<td>June</td>
<td>4</td>
</tr>
<tr>
<td>July</td>
<td>5</td>
</tr>
<tr>
<td>August</td>
<td>6</td>
</tr>
<tr>
<td>September</td>
<td>7</td>
</tr>
<tr>
<td>October</td>
<td>8</td>
</tr>
<tr>
<td>November</td>
<td>9</td>
</tr>
<tr>
<td>December</td>
<td>10</td>
</tr>
<tr>
<td>January</td>
<td>11</td>
</tr>
<tr>
<td>February</td>
<td>12</td>
</tr>
</tbody>
</table>

This curious numbering is chosen because in each leap year February gets an extra day. So it is convenient to begin a year with March and to close it with February. Then February 28, 1999 will be considered as the last day of 1998. If someone is born on the $r$th day of the $m$th month of the year $N = 100C + D$, $0 \leq D \leq 99$, then we can obtain $d$ the day of the week by the following:

\[
  d = r + \left\lfloor \frac{13m - 1}{5} \right\rfloor - 2C + D + \left\lfloor \frac{C}{4} \right\rfloor + \left\lfloor \frac{D}{4} \right\rfloor \pmod{7}
\]

where $\left\lfloor x \right\rfloor$ = integral part of $x$.

Let us calculate the day of the week for July 13, 1938. Here $r = 13$, $m = 5$, $C = 19$, $D = 38$. Then

\[
  d = 13 + \left\lfloor \frac{13 \times 5 - 1}{5} \right\rfloor - 2 \times 19 + 38 + \left\lfloor \frac{19}{4} \right\rfloor + \left\lfloor \frac{38}{4} \right\rfloor \pmod{7}
\]

\[
  = 13 + \left\lfloor \frac{64}{5} \right\rfloor - 38 + 38 + \left\lfloor \frac{19}{4} \right\rfloor + \left\lfloor \frac{38}{4} \right\rfloor \pmod{7}
\]

Since $13 = 7 + 6$, we say that $13 \equiv 6 \pmod{7}$, $\left\lfloor \frac{64}{5} \right\rfloor = 12 = 7 + 5 \equiv 5 \pmod{7}$, $\left\lfloor \frac{19}{4} \right\rfloor = 4$, $\left\lfloor \frac{38}{4} \right\rfloor = 9 \equiv 2 \pmod{7}$. Then $d = 6 + 5 + 4 + 2 = 17 \equiv 3 \pmod{7}$. Therefore July 13, 1938 falls on a Wednesday.

**Answer to Problem 1:** $1, 2, 4, 8, 16$. You can find more information about the author at the Internet address:

http://www.math.ualberta.ca/People/Facultypages/Sharma.A.html

"I know you handed in almost every assignment. You almost handed in one this week, you almost handed in one last week ..."

"Two things are infinite: the universe and human stupidity; and I’m not sure about the universe." Albert Einstein

A famous statistician would never travel by airplane, because he had studied air travel and estimated the probability of there being a bomb on any given flight was 1 in a million, and he was not prepared to accept these odds.

One day a colleague met him at a conference far from home.

"How did you get here, by train?"

"No, I flew."

"What about your the possibility of a bomb?"

Well, I began thinking that if the odds of one bomb are $1,000,000$, then the odds of TWO bombs are $\frac{1}{1,000,000} \times \frac{1}{1,000,000}$. This is a very, very small probability, which I can accept. So, now I bring my own bomb along!" (Philip Clarke)