This question is about partying & getting wasted over the summer break.

1. Classes end on June 10 this year and begin again on September 1.
   a. How many days of summer vacation will HWW math club members have for … well, doing math? ★★
   b. Julian, a math whiz, plans on doing enormous quantities of math over summer. The day after school ends, he spends six hours doing math. However, Julian slowly loses motivation and spends 5% less time doing math each day after. How much time would Julian have spent doing math by the end of the summer? ★★★

2. It's almost time for the Math HL exams, which is bad news for Wen Li, who can't do math to save his life. The exam consists of 60 questions multiple choice, each with 5 choices; ¼ of a mark is taken off for each incorrect answer. If Wen Li can eliminate two of the five choices then proceeds on guessing randomly from the remaining three, what score can he expect to get on the test? ★★

3. Bai is taking the Mandarin exam, which is really, really bad because he can barely speak Mandarin. The test consists of 50 questions multiple choice, with no penalty for guessing. Fortunately, the teacher never puts the same choice twice in a row. If Bai's Chinese is so bad that he cannot even read the questions, can he use this information to his advantage? If so, what score can he expect to get? ★★★

4. Jason spends all summer playing Minecraft, in which, of course, you build things like this:

   How many blocks will Jason need to build the 30th tower? ★★★★

5. James and Jerry decide to go to China over the summer to climb some mountains. At the summit they can just barely see the city of Beijing on the horizon. Of course, being a mathematician Jerry pulls out his phone and

discovers using Google Maps that he is exactly 200 km from Beijing. If the radius of the Earth is 6000 km, how tall is the mountain? ★★★★

6. Everyone knows that when school ends and summer begins, math club members become drug dealers.
   a. Will, smuggling some cocaine across the Mexican border, is intercepted by police; but, with his amazing foresight he jumps into a circular lake and swims to the center, while the police wait him out on the edge. The police, who are clearly Americans, can run three times faster than Will can swim, but Will can run faster than the police. Can Will outrun the police? ★
   b. Josh is in a similar position, except the police pursuing him are slightly faster; they can run 3.143 times faster than he can swim. Can Josh still escape the police? ★★★★★
   c. How fast must the police be in order to avoid being outsmarted by teenagers with a knowledge of grade eight math? ★★★★★★★