Number Fun:

1. What is the missing number in this list: 1, 64, 125, 216, 729, 13824, 15625, _____, 132651?

2. Find 2 ways that one can express 100 as the sum of 3 integers, each raised to the power of 3 (using either positive or negative integers). There are only 3 known answers, one of which is $190^3 - 161^3 - 139^3 = 100$. One solution has numbers smaller than these given and one solution has numbers larger.

3. What is unique about the number 854,917,632 (other than the fact that it contains all the digits from 1-9)?

4. What number is next on this list? 0, 1, 8, 11, 69, 88, 96, 101, _____

5. Scholars discovered "2520" in hieroglyphics engraved on a stone lid in an Egyptian pyramid. Why was such an honor paid to this number?

6. Find 3 numbers, each less than 500, such that their sum is a perfect square and the sum of any two is also a perfect square.

7. The year 1991 was a palindromic year, as was the year 2002 (a gap of 11 years).
   a) When was the last time there was the shortest gap between 2 palindromic years?
   b) When will be the next time?

8. Study the numbers in each horizontal and vertical line in the box below and determine the missing number.

15	8	5
4	15	4
4	5	?

9. Find the sum of , $\frac{1}{i}+\frac{3}{i^3}+\frac{5}{i^5}+\frac{7}{i^7}+\ldots+\frac{53}{i^{53}}$ where $i=\sqrt{-1}$

10. There are five triples of real numbers (x, y, z) such that $xy = z$, $xz = y$, and $yz = x$. Name these five triples.

11. What is the smallest number you can write using all of these Roman numerals, once each:
    I, C, X, L, V? (Answer in Roman numeral form)

12. Using this list of numbers: 1 2 3 4 5 6 7 8, what number is two to the right of the number that is immediately to the right of the number four to the left of the number immediately to the right of the number two to the left of the number that lies midway between the number two to the right of the number 6 and the number three to the right of the number 3?

13. I have eight integers 0n my list. Use the clues to find the numbers.

1) The range (statistical sense) of the numbers in my list is 93.
2) One of my numbers is an abundant number between 21 and 25.
3) One of the numbers in my list is a perfect cube less than 10.
4) The arithmetic mean of the numbers in my list is 40.
5) The mode of the list is the sum of the first two perfect numbers.
6) The median of the numbers in my list is 29.5.
7) The largest number in my list is the smallest 3-digit palindrome.
8) The sum of the digits of one of the numbers is its square root.

What are the eight numbers?

14. Suppose the odd numbers are grouped in the following way: {1}, {3,5}, {7,9,11}, {13, 15, 17, 19}, . . . What is the sum of the numbers in the tenth grouping?

Bug Fun:

15. Inside a rectangular room, which is 30 ft. long and 12 ft. wide and high, a spider is at a point in the center of one of the end walls. This point, point A, is 1 ft. from the ceiling. A fly is on the opposite wall, 1 ft. from the floor, in the center, at point B. What is the shortest distance that the spider may crawl in order to reach the fly, which remains stationary?

Day & Time Fun:

16. How many minutes is it before 1 PM if thirty minutes ago it was four times as many minutes past 9 AM?

17. Ms. Selph, being from a rural Southern town, does not always answer questions the way I expect. I asked her a simple question one day, which was "What day of the week is this?" The following is the smart answer that I received: "When the day after tomorrow is yesterday, today will be as far from Sunday as today was from Sunday when the day before yesterday was tomorrow." What day of the week was it?

18. Since Ms. Selph was of no help to me, I eventually had to look at a calendar to find the answer to my previous question. But, a few days down the road, with no calendar nearby, I asked Mrs. Doker to help me out and asked her, "What day of the week is this?" She was of no help to me either, when she stated, "You need to find which day is 2 days before the day immediately following the day 3 days before the day 4 days after the day 2 days after the day 3 days before the day immediately before Thursday. Then you will have your answer." AAAAAAGGGHHHH!!! What day of the week was it then?

Random Fun:

19. My compact disc player has a shuffle feature, where it plays the tracks on my CD in random order. But, I can also program it to play the tracks in any order I want. My favorite CD has 10 tracks. If I decided to play the disc once each day and program the 10 tracks to be played in a different order each day, how long would it take before I had heard the 10 tracks played in every possible order (in days)?

20. A rope over the top of a fence has the same length on each side, and weighs one-third of a pound per foot. On one end hangs a monkey holding a banana, and on the other end a weight equal to the weight of the monkey. The banana weighs 2 ounces per inch. The length of the rope in feet is the same as the age of the monkey, and the weight of the monkey in ounces is as much as the age of the monkey's mother. The combined ages of the monkey and its mother are 30 years. One-half the weight of the monkey, plus the weight of the banana is one-fourth the sum of the weights of the rope and the weight. The monkey's mother is one-half as old as the monkey will be when it is three times as old as its mother was when she was one-half as old as the monkey will be when it is as old as its mother will be when she is four times as old as the monkey was when it was twice as old as its mother was when she was one-third as old as the monkey was when it was as old as its mother was when she was three times as old as the monkey was when it was one-fourth as old as it is now. How long is the banana?

21. Count, but spell out the values: ONE, TWO, THREE, ... When do you first encounter the letter "C"? In other words, what is the first number that contains the letter "C"?

22. **"Jack & Diane"**—They have been immortalized in song, but how old are they? When Jack was twice as old as Diane was when Jack was half as old as he is now, then Diane was half as old as Jack was when Diane was a year older than half as old as Jack is now. If they both are in their twenties and their ages are whole numbers of full years and Jack is older than Diane, then just how old are Jack & Diane?

23. Correct the following equation by freely moving the given 4 digits, but WITHOUT adding any mathematical symbols: 26 = 47

24. A frog sits on a log in a hole at the bottom of the sea. Each of his 4 feet has 4 toes and each toe has 2 warts. This species of frog can have red, blue, or purple warts. What is the probability that this particular frog has all purple warts?

25. Cutty loves to build airplanes and airplane engines. He can make a total of 30 items an hour (of either one). When building, in order to avoid boredom, he starts the day by building 50 engines, then switches to building 50 planes. Then he switches back to engines and keeps switching back and forth doing 50 of each until his day is done. Assuming Cutty starts building at 8 AM, at what time will he finish his 108^{th} engine?

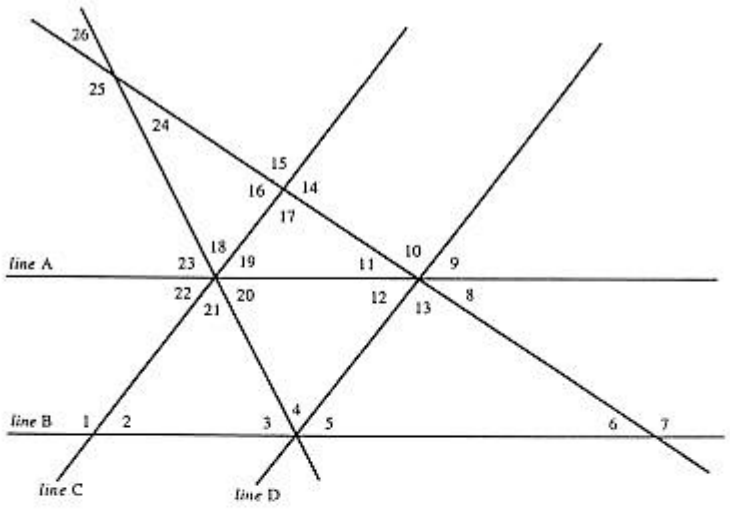
26. This is supposed to be one of the questions for potential Microsoft employees. Microsoft expects you to answer this question in less than 5 minutes!

"U2" has a concert that starts in 17 minutes and the group members must all cross a bridge to get there. All four men begin on the same side of the bridge. You must help them across to the other side. It is night. There is one flashlight. A maximum of two people can cross at one time. Any party who crosses, either one or two people, must have the flashlight to see. The flashlight must be walked back and forth; it cannot be thrown, etc. Each band member walks at a different speed. A pair must walk together at the rate of the slower man's pace, based on this information:

*Bono - 1 minute to cross
*Edge - 2 minutes to cross
*Adam - 5 minutes to cross
*Larry - 10 minutes to cross

For example, if Larry and Bono walk across first, 10 minutes have elapsed when they get to the other side of the bridge. If Larry then returns with the flashlight, a total of 20 minutes will have passed and you will have failed. How do you get them all across in time for the concert? (list who goes in each step)

27. For those of you that love geometry:



Given that *line* A ∥ *line* B and *line* C ∥ *line* D and $m\angle 1 = 110°$ $m\angle 3 = 55°$ $m\angle 13 = 90°$

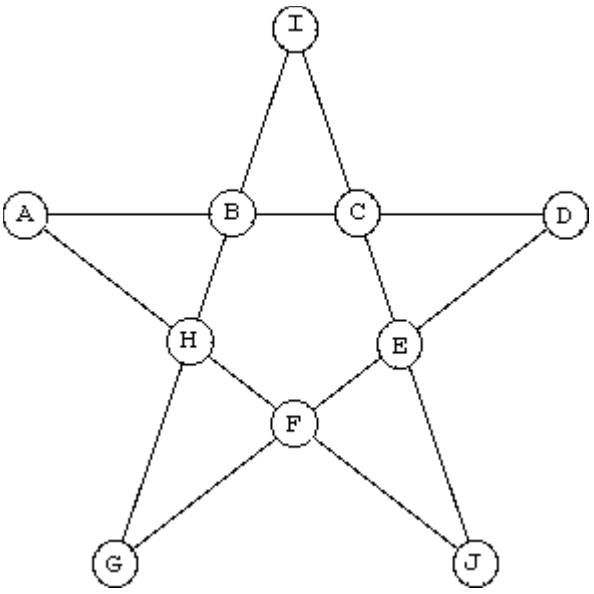
$m\angle 1 =$	$m\angle 2 =$	$m\angle 3 =$	$m\angle 4 =$	$m\angle 5 =$
$m\angle 6 =$	$m\angle 7 =$	$m\angle 8 =$	$m\angle 9 =$	$m\angle 10 =$
$m\angle 11 =$	$m\angle 12 =$	$m\angle 13 =$	$m\angle 14 =$	$m\angle 15 =$
$m\angle 16 =$	$m\angle 17 =$	$m\angle 18 =$	$m\angle 19 =$	$m\angle 20 =$
$m\angle 21 =$	$m\angle 22 =$	$m\angle 23 =$	$m\angle 24 =$	$m\angle 25 =$
$m\angle 26 =$				

28.

What is the weight of the unpeeled banana?

29. Can you number the five corners and five crosspoints of a pentagram with the numbers 1, 2, 3, 4, 5, 6, 8, 9, 10, and 12 in such a way that the sum of the four numbers on each of the five lines is equal (using each number only once)? SEE DIAGRAM.

Just give the value of each letter on the diagram (A – J).



30. Unscramble the cryptogram which is a famous quote and the author of it:

MX M SHDL WLLA XTBJSLB MJ MW CZ WJHAFMAY GA JSL WSGTVFLBW GX YMHAJW

- WMB MWHHU ALPJGA