

Brainteasers: Mathematical thinking

Problem One - A: Mission Possible

A "Shift 3" code is determined by placing an alphabet sequence above another set and shifting the bottom set three places to the right. Letters at the end of the bottom sequence are wrapped around to the front as indicated in the example below.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	(Top)
X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	(Bottom)

Eg. Using the above code QBXZEBOP KBQ → TEACHERS NET

Joke:

Boy: While walking along the road I found a pencost !

Girl: What's a pencost ?

Boy: Vwjpo adqz xzion

[The boy's coded answer to the joke above is in "Shift 5"code - can you translate it?]

Problem Two: Number Cruncher

224

You need to fill in the blank blocks. The sum of each row, column and diagonal must equal the totals revealed in the outer layer of blocks.

For example, the first row on top must add up to a total of 147, the first column on the left must add up to a total of 171 and the diagonal starting in the top left hand corner must add up to 214.

	54		16	19	147
		19	67	4	180
65		43	42	38	266
	15	36	48		121
	45	81			309
171	277	225	250	100	214

Problem Three: Riddle me this?

Come up with creative solutions to the following Brain Crunching riddles. Read the questions carefully!

1. Before Mount Everest was discovered, what was the highest mountain on Earth?
2. Captain Frank and some of the boys were exchanging old war stories. Art Bragg offered one about how his grandfather led a battalion against a German division during World War I. Through brilliant maneuvers he defeated them and captured valuable territory. A week after the battle he was presented with a sword bearing the inscription "To Captain Bragg for Bravery, Daring and leadership. World War I. From the Men of Battalion 8." Captain Frank looked at Art and said, "You really don't expect anyone to believe that yarn, do you?" What's wrong with the story?
3. A woman from New York married ten different men from that city, yet she did not break any laws. None of these men died and she never divorced. How was this possible?
4. A taxi driver was called to take a group of passengers to the train station. The station is normally an hour away, but with traffic being extra heavy, it took a full hour and a half. On the return trip, the Traffic was still as heavy and yet it took only 90 minutes. Why?
5. How could you rearrange all the letters in the words "new door" to make one word?
Note: There is only one correct answer.
6. Even if they are starving, natives living in the Arctic will never eat a penguin's eggs. Why not?
7. Which is correct? "The yolk of the egg are white" or "The yolk of the egg is white"?
8. In Okmulgee, Oklahoma, you cannot take a picture of a man with a wooden leg. Why not?
9. A father and his son go hunting. A lion attacks them both. The father and son are both rushed to hospital. The Father is unconscious and cannot speak. His son needs an emergency operation. The surgeon walks in and before any operation takes place, the surgeon says, "I am sorry I can not operate on my son!" Who is the surgeon?
10. This is an unusual paragraph. I'm curious how quickly you can find out what is so unusual about it? It looks so plain you would think nothing was wrong with it! In fact, nothing is wrong with it! It is unusual though. Study it, and think about it, but you still may not find anything odd. But if you work at it a bit, you might find out! Try to do so without any coaching!

Problem Four: - Quickies

1. If it took eight men ten hours to build a wall, how long would it take four men to build it?
2. Approximately how many birthdays does the average American woman have?
3. If you had three apples and four oranges in one hand and four apples and three oranges in the other hand, what would you have?
4. How can a man go eight days without sleep?
5. If you throw a red stone into the blue sea what it will become?
6. What often falls but never gets hurt?
7. What looks like half an apple?
8. What gets wet with drying?

Problem Five: The last string

You have two pieces of fuse (both of which have weird shapes and they do not burn uniformly), each of which burns for exactly 1 minute. You may not use scissors, stopwatch or counting and bear in mind that the burn rate can vary along both fuses. It is essential to understand that the fuses do not BURN evenly – there are parts where they burn slowly and parts where they burn quickly. This is a three-part question:

- 1) How do you measure 60 secs ?
- 2) How do you measure 30 secs ? (HINT: Using the idea of number one)
- 3) How do you measure 45 secs? (HINT: Using the idea of one and two)

Solutions

Problem one: – About five cents.

Problem two: See solution below.

					224
12	54	46	16	19	147
5	85	19	67	4	180
65	78	43	42	38	266
9	15	36	48	13	121
80	45	81	77	26	309
171	277	225	250	100	214

Problem Three: Riddle me this?

1. Mount Everest.
2. Could not have known it was WW1 at the time.
3. Minister.
4. Same amount of time.
5. One word
6. Eggs are found in the Antarctic
7. Neither – it is yellow
8. You need a camera.
9. His Mother
10. No Letter E

Problem Four: - Quickies

1. No time at all it is already built.
2. Just one. All the others are anniversaries.
3. Very large hands.
4. He sleeps at night.
5. It becomes wet.
6. Rain
7. The other half.
8. A towel.

Problem five: The last string

1. How do you measure 60 secs ? Light one end and watch it burn until it reaches the end
2. How do you measure 30 secs ? Light both ends of one fuse and where they meet (It wont be in the middle!!!) that will mean it took 30 seconds.
3. How do you measure 45 secs ? First, simultaneously light one piece of fuse at both ends and the second piece at one end. The first piece will burn in 30 seconds. As soon as it finishes burning, light the second piece of fuse at its other end. The second fuse will burn for 15 more seconds, which completes the 45 seconds.