Math Challenge #2

SOLUTIONS

Digits, Numerals, and Numbers

	Problems	*Answer*
1.	What is the largest 2 digit even number?	*98*
2.	What is the greatest 4-digit odd number whose digits are all different?	*9875*
3.	Write three ***different*** three-digit numbers that use the digits 3, 5 and 5.	*355, 535, 553*
4.	 Forty Panda bears have how many pairs of front paws? Each Panda bear has 1 pair of front paws; thus 40 panda bears will have 40 pairs of front paws	*40 pairs of front paws*
5.	Use the digits 1, 3, 7 to write a number whose ones digit is smaller than its tens digit, but bigger than its hundreds digit.	*173*
6.	Write the four different 3-digit numbers that use the digits 0, 2, and 5 once each. The number can't start from zero, it will be a 2-digit number, not three. Thus, the four different 3-digit numbers are: 205, 250, 502, 520	*205, 250, 502, 520*
7.	There are 3 ways to add two one-digit numbers to get a sum of 16: 9 + 7, 8 + 8, 7 + 9. How many ways are there to have the sum of 7 rolling two fair cube dice?  6 ways: 1+6, 2+5, 3+4, 4+3, 5+2, 6+1	*6 ways*
8.	Alex uses combination master lock to his treasure box. He uses digits: 5, 5, 7, and 3. Use the clues to figure out the code that opens the master lock. • 7 is not on an end • The two ends are different digits. • 3 is on the far right • Two 5's are not next to each other. Use Guess and Check. Read the clues several times to deduct the answer 5753.	*5753*
9.	What number is $\frac{1}{4}th$ of the way from 118 and $\frac{3}{4}th$ of the way from 162? 162 – 118 = 44 distance between two numbers. ¼th of 44 is 44 ÷ 4 = 11. 118 + 11 = 129 or 162 – 33 = 129	*129*

Use the table to solve the problems *10-12*. Hawaii Fruit market sells fruit:

Fruit	**Price (¢)**
Rambutan	*19*
Dragon Fruit	*9*
Guava	*49*
Lilikoi	*39*
Soursop	*99*
Cherimoya	*29*

	Problems	*Answer*
10.	What is the only amount below that could be the total cost of any 6 fruits from the list? 233 cents 234 cents 235 cents 236 cents The ones digit of cost of any fruit is 9. So, if we add 6 fruit we'll have 9*6 = 54. The ending digit will be 4. So only 234 cents will work. In fact, 6 lilikoi will cost 6*39 = 234 cents.	*234 cents*

11. Moana buys a bag of fruit for a total of 186 cents or $1.86. No two fruits in the bag are the same. How many fruits are in her bag?

There couldn't be more than 6 fruits, or there will be same fruit for sure.
186 has units digit 6. All the prices end on 9, so what multiplying 9 will give 6 at the end? 4*9 = 36. Let's check what 4 fruits are there. It could be soursop, lilikoi, cherimoya, rambutan: 99 + 39 + 29 + 19 = 186 cents
Or soursop, guava, cherimoya, dragon fruit: 99 + 49 + 29 + 9 = 186 cents

4 fruits

12. Maui buys a bag of fruit for 108 cents or $1.08. All the fruit in his bag are the same. What fruit did Maui buy? The cheapest fruit is 9 cents. So, the most fruit he can buy is dragon fruit let's try it. 108 ÷ 9 = 12. Works! 108 has 8 in ones place. All the prices end on 9, to get 8 in ones place means he could have bought 2, 12, 22, etc. fruit. He couldn't buy 2 fruits as no fruit costs 54 cents. But 108 ÷ 9 = 12 dragon fruits.

12 dragon fruits

13. What is the ***biggest sum*** you can get solving the puzzle where each letter stands for some digit, different letters stand for different digits, same letters for the same digit.

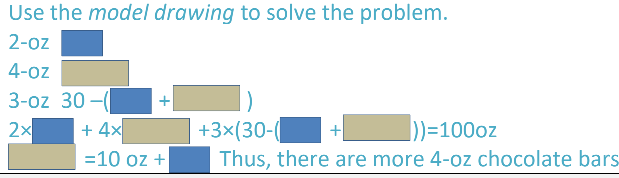
$$\begin{array}{r} PRIME \\ \underline{+EVEN} \end{array}$$

To create the biggest sum, we'll use the biggest digits. P=9 it stands in 10,000's place, R could be 8 or 7, but because E happens more times E=8, R=7, I=6, V=5 (or vice versa, they are standing in the same value position), M=4, N = 3. The sum of 97648 + 8583=106,231 is the biggest

106,231

14. A shopkeeper of CandyLand has 30 chocolate bars, each of which weighs 2, 3, or 4 ounces. The total weight of the bars is 100 ounces. Which bars does the shopkeeper have more: 2-oz or 4-oz bars?

Use the *model drawing* to solve the problem.



Guess and Check
20 bars ×4 = 80 oz.
10 bars ×2 = 20 oz. 30 bars, 100 oz. We have more 4-oz chocolates, than 2-oz.

4-oz chocolate bars

15. Two numbers with no zeros in their make-up (the way how you write them) can be multiplied to create 10,000. What are those numbers? To create a zero at the end of the number, the number should be divisible by 10. Factor 10,000=200*50=4*5*5*10*10=2*2*2*2*5*5*5*5. We can't create any multiples of 10, so the only possible two numbers that after multiplication will give 10,000 are: 16 and 625.

16 and 625

16. At the end of the day shop helper Jenny counted all the chocolate bars that remained on the shelves of Candy Store, but in hurry to go home, the number she wrote in the journal was missing its final digit. The following morning Jenny's boss found out that the number of chocolate bars on the shelves was greater by 89 than the number found in Jenny's journal. How many chocolate bars were on the shelves?

If at the end of the integer we'll write 0, it will increase 10 times. Jenny couldn't have written a number greater than 10, because the real number of chocolates than would differ from her number at least 10 times. For example, 101 and 1011: 1011-101=910. So Jenny wrote a single-digit number. Because the difference is 89, Jenny wrote 9 and forgot to write the ones digit. 9+89 = 98. There were 98 chocolate bars.

98 chocolate bars

17. Two friends Larry and Garry played BINGO. After some time, Garry flushed with excitement and yelled out: "BINGO!" and said:

B	I	N	G	O
2	22	32	50	61
14	30	35	47	64
7	25	Free	52	72
5	19	37	59	70
11	27	45	48	75

a) "My BINGO has all prime numbers"
b) "The numbers in my BINGO add up to 138"
c) "My BINGO is a vertical line"
d) "My BINGO uses the FREE space"

One statement was false (lie); the rest were true. Where was Garry's BINGO? BINGO can go only in a row, column or diagonals. The only prime numbers on a card are 2, 61, 47, 7, 5, 19, 37, 59, 11. Statement a) can be correct if it's diagonal 11, 19, Free, 47, 61. The sum of these numbers 11 + 19+47+61= 138. This diagonal goes through Free cell. So, the statement c) is false. BINGO is the diagonal 11, 19, Free, 47, 61

11, 19, Free, 47, 61

18. How many 2-digit whole numbers have no odd factor except 1?
The factors of such numbers should be 1 and 2 in different powers. 2-digit whole numbers which are multiples of 2 are 16, 32, 64. So there are only 3 numbers that will work

3 numbers

Solution is available on 10/20/2017 at www.mathinaction.org