

PUZZLES

1. $ABCD \times E = DCBA$

(Replace letters with digits and have the answer be true. A,B,C,D and E are all different digits.)

$$2178 \times 4 = 8712$$

2. Solve this:

$$ALFA + BETA + GAMA = DELTA$$

Replace letters with digits and have the sum be true. There is more than one solution.

Solutions courtesy of Bill Tomlinson:

$$5305 + 2475 + 6595 = 14375$$

$$5305 + 2485 + 6595 = 14385$$

$$5395 + 2475 + 6505 = 14375$$

$$5395 + 2485 + 6505 = 14385$$

$$5705 + 2435 + 6595 = 14735$$

$$5705 + 2485 + 6595 = 14785$$

$$5795 + 2435 + 6505 = 14735$$

$$5795 + 2485 + 6505 = 14785$$

$$5805 + 2435 + 6595 = 14835$$

$$5805 + 2475 + 6595 = 14875$$

$$5895 + 2435 + 6505 = 14835$$

$$5895 + 2475 + 6505 = 14875$$

$$5305 + 6475 + 2595 = 14375$$

$$5305 + 6485 + 2595 = 14385$$

$$5395 + 6475 + 2505 = 14375$$

$$5395 + 6485 + 2505 = 14385$$

$$5705 + 6435 + 2595 = 14735$$

$$5705 + 6485 + 2595 = 14785$$

$$5795 + 6435 + 2505 = 14735$$

$$5795 + 6485 + 2505 = 14785$$

$$5805 + 6435 + 2595 = 14835$$

$$5805 + 6475 + 2595 = 14875$$

$$5895 + 6435 + 2505 = 14835$$

$$5895 + 6475 + 2505 = 14875$$

3. Solve the following (each letter represents a particular digit 0 to 9):

$$ABC + DEF = GHIJ$$

$$437 + 589 = 1026$$

or

$$743 + 859 = 1602$$

4. Solve the following (D and E are two different digits):

$$(DD)^E = DEED$$

$$11^3 = 1331$$

5. Solve the following (each letter is a separate digit):

$$(L+O+G+I+C)^3 = \text{LOGIC}$$

$$(1+9+6+8+3)^3 = 19683$$

"Robbie" has worked out another solution, but it uses 7 twice:

$$(1+7+5+7+6)^3 = 17576$$

6. There are 2 trees in a garden (tree "A" and "B") and on the both trees are some birds.

The birds of tree A say to the birds of tree B that if one of you comes to our tree, then our population will be the double of yours.

Then the birds of tree B tell to the birds of tree A that if one of you comes here, then our population will be equal to that of yours.

Now answer: How many birds in each tree?

ANSWER: The solution is 7 and 5.

7 on tree A, and 5 on tree B

7. RE + MI = FA

$$\text{DO} + \text{SI} = \text{MI}$$

$$\text{LA} + \text{SI} = \text{SOL}$$

(Replace letters with digits and have the sums be true.)

$$27 + 56 = 83$$

$$40 + 16 = 56$$

$$93 + 16 = 109$$

8. Find a 10-digit number where the first digit is how many zeros in the number, the second digit is how many 1s in the number etc. until the tenth digit which is how many 9s in the number.

6210001000

9. Use the numerals 1, 9, 9 and 6 exactly in that order to make the following numbers: 28, 32, 35, 38, 72, 73, 76, 77, 100 and 1000

You can use the mathematical symbols +, -, ×, /, √, ^ (exponent symbol) and brackets.

Example: $1 \times 9 + 9 \times 6 = 63$

$$1 + 9 + \sqrt{9} \times 6 = 28$$

$$(1/\sqrt{9}) \times 96 = 32$$

$$-19 + (9 \times 6) = 35$$

$$19 / (\sqrt{9} / 6) = 38$$

$$(1 + \sqrt{9}) \times \sqrt{9} \times 6 = 72$$

$$19 + (9 \times 6) = 73$$

$$1 + (9 \times 9) - 6 = 76$$

$$-19 + 96 = 77$$

$$1 + \sqrt{9} + 96 = 100$$

$$(1+9)^{(9-6)} = 1000$$

10. What is unique about 8549176320 ?

It is the digits 0 to 9 in **alphabetical** order.

Note: it can also be exactly divided by all of the digits 1-9 except 7

11. Find a number with its letters in alphabetical order.

Example: "five" has "fiv" in alphabetical order, but not "e".

Forty

It is the only number we know of in English with its letters in alphabetical order. And that is the correct spelling.

12. Tim saw that his oven digital clock was showing 1:23, and noticed that each number was one higher than the number to its left.

He wondered: of all the different clock times from 0:00 to 12:59, how many are like that? And what exactly are those clock times?

Can you help Tim out?

We may have missed one or two, but this is what we got:

0:12

1:23

2:34

3:45

4:56

12:34

Can you do better?

Note 1: Some clocks display all 4 digits, so would only have 01:23 and 12:34

Note 2: a 24-hour clock could also have 23:45

13. **Math Riddle One of Ten: How Many Handshakes?**

If there are 20 people in a room and they each shake each other's hand once and only once, how many handshakes were there all together?

14. Nine kiwis look identical except the one which is lighter. How can you weigh only 2 times on a balance scale to find out which one is lighter?

Solution & Explanation

If we give a number for each kiwi, say from 1 to 9. We put kiwi 1, 2, and 3 on the left and kiwi 4, 5 and 6 on the right and weight them. If they are balanced then we know kiwi 1 to 6 is OK. We just need to put kiwi 7 on one side and kiwi 8 on the other side and weight them. Now weighing them if one side is lighter, we get our lightest one. Otherwise, the one kiwi left aside will be lighter.

15. Can you name the biggest number that can be written with two 1's and two 0's?

Solution & Explanation

People often think of the number 1100 as the biggest number that can be written with two 1's and two 0's.

But there is a number many, many times greater than this number, namely:
 10^{10}

In fact, 10^{10} is almost ten million times greater than 1100.

16. What is the biggest number that can be written with four 9s?

Solution & Explanation

Generally the biggest number that people often think with four 9s is the number 9999.

But the biggest number is a number many, many times greater than this number i.e., 99^{99}

Thus, the biggest number 99^{99} is much greater than 9999.

17. In the following question, one term in the number series is wrong, find out the wrong term.

1, 7, 56, 224, 448

Solution & Explanation

The term of the series are (1^3-0^3) , (2^3-1^3) , (4^3-2^3) , (6^3-3^3) , (8^3-4^3) . So 224 is wrong and must be replaced by $(6^3-3^3)= 189$.

18. Find the wrong term in the series: 5, 27, 61, 122, 213, 340, 509

Solution & Explanation

The terms of series are 2^3-3 , 3^3-3 , 4^3-3 , 5^3-3 , 6^3-3 and so on . So 27 is the wrong term which should be replaced by $3^3-3 = 24$

19. Complete the following series:

520, 738, ?, 1342

Solution & Explanation

$520 = 8^3+8$, $738 = 9^3+9$, $1342 = 11^3+11$, so missing number is $10^3+10 = 1000 + 10 = 1010$. So answer is 1010.

20. I went on a holiday to a hill station. It snowed for 15 days. But when it snowed in the morning the afternoon was lovely. And when it snowed in the

afternoon the day was preceded by a clear morning. Altogether there were 14 very nice mornings and 17 very nice afternoons. How many days did my holiday last?

Solution & Explanation

Let the holiday lasted for x days. If 14 mornings were nice, then $x - 14$ evening had snow.

Similarly If 17 evenings were nice, then $x - 17$ morning had snow. So we have

$$x - 14 + x - 17 = 15 \Rightarrow x = 23.$$

21. I bought a car with a peculiar 5 digit numbered license plate which on reversing upside down could still be read. On reversing value is increased by 58212. What is the original number if all digits were different?

Solution & Explanation

Only 0 1 6 8 and 9 can be read upside down. Therefore the original number must be 10689 and the number after reversing upside down is 68901, only then the difference given can be generated.

22. Aman has a certain number of apples with him. He gives half of the apples and then half an apple to Mohit. Then he gives half of the remaining apples and then half an apple to Rahul. And in the same way he gives to Rohit. After giving it to Rohit, he has 9 apples. What is the number of apples that Aman was having in the beginning.?

Solution & Explanation

Solve this question backwards and get the answer as 79 apples. You can apply the formula as (apples in the end $2 + 1$) and apply this formula as many times as is the number of persons to whom he has distributed the items given.

23.If 20 boys and 20 girls eat 20 apples in 20 minutes, in how many minutes will one boy and one girl take to eat one apple ?

Solution & Explanation

Since 20 boys and 20 girls eat 20 apples in 20 minutes, means they will eat 1 apple in 20 minutes. It will be 20 minutes and not one minute.

24.Sita and Gita were walking on the road. Sita said, "I weigh 55 Kgs. What is your weight?" Gita replied that she wouldn't disclose her weight directly as she is obese. But she said, "I weigh 50 Kgs plus one third of my weight." Find the weight of Gita?

Solution & Explanation

Solving mathematically, let's assume that her weight is X Kgs.

$$X = 50 + \frac{X}{3}$$

$$3 * X = 150 + X$$

$$X = 75 \text{ Kgs}$$

25.Following facts are true about Ludhiana:
No two citizens have exactly the same number of coins.
No citizen has exactly 2025 coins.
There are more citizens than there are coins with any one citizen.
What is the largest possible number of the citizens of Ludhiana?

Solution & Explanation

It is given that no citizens have exactly 2025 coins. Hence there are 2025 citizens with 0 to 2024 coins.

Suppose there are more than 2025 citizens. But these will violate the condition that "There are more citizens than there are coins with any one citizen." As for any

number more than 2025, there will be same number of citizens as the maximum number of coins with any citizen.