

Math Magic – Explained by Algebra!

Guess the card

From an ordinary deck of cards, remove the face cards and the tens. Shuffle well!

DIRECTIONS

1. Have a friend choose a card, without showing you.
2. Have your friend secretly
 - a. Multiply the card by 2
 - b. Add 3 to the result;
 - c. Multiply this latest result by 5;
 - d. If the card is a club, add 1; if the card is a diamond, add 2; if the card is a heart, add 3; if the card is a spade, add 4.
 - e. Tell you the final answer.
3. In your head, subtract 15 from your friend's answer.
4. The answer to step 3 tells you which card your friend has.

Think of a Number

DIRECTIONS

1. Think of a number.
2. Multiply it by 2.
3. Add 2.
4. Divide by 2.
5. Finally, subtract 1.
6. Compare your answer with your first number.

Will this work all the time?

Could you use this as a trick?

All the same

1. Write down a 3-digit number with the digits all the same.
2. Add the three digits.
3. Divide the answer to step 1 by the answer to step 2.

Was your answer 37? Will it always be?

Popular Numbers

Have a friend write down a favourite number which is less than 10, and another number between 10 and 99.

DIRECTIONS

Have your friend:

1. Choose two numbers;
2. Add the numbers;
3. Multiply the answer by 5;
4. Add the smaller chosen number;
5. Multiply this sum by 2;
6. Subtract the smaller chosen number.

Ask for the answer.

If you carefully examine the answer, you can tell what two numbers were chosen!

WORKED EXAMPLE

7, 1	18
90	97
194	187

The numbers were 7 and 11 (18-7).

Roll 'em

To do this trick you need three dice. This trick is meant to be done with a friend, but you may want to practice on yourself first!

While your back is turned, have a friend do these five steps. Your friend tells you nothing!

1. Roll the three dice.
2. Add up the three top numbers.
3. To the result in step 2, add the bottom number of one of the dice.
4. Roll this die again.
5. Add this new top number to the total, and remember the answer.

The stage is now set for you to impress your friend. Turn around, and have your first look at the three dice. Add 7 to the total of the three top numbers. Your answer should be your friend's answer!

Remind your friend that you didn't see the original roll of the dice, and you didn't know which one was rolled again but you still got the answer!

Happy Birthday

Have you forgotten when your best friend's birthday is? Are you too embarrassed to ask? Here's a sneaky way to find out, if you can get your friend to do a little arithmetic.

Have your friend write his or her month and day of birth on a piece of paper without letting you see it.

For example, if February 25 is the big day, your friend would write: 2, 25

MONTH NUMBERS

- | | | |
|-------------|-----|-----------|
| 1. January | 7. | July |
| 2. February | 8. | August |
| 3. March | 9. | September |
| 4. April | 10. | October |
| 5. May | 11. | November |
| 6. June | 12. | December, |

Now have your friend secretly do the following.

Write the month number

Multiply by 5

Add 7

Multiply by 4

Add 13 . . .

Multiply by 5

Add the day number

At this point ask for your friend's answer. Now you subtract 205 from that answer. The result will quickly tell you when the birthday is!!

Faster Than a Speeding Human

With this trick you will appear to be the world's fastest calculator! How fast?

So fast that you will know the answer before the example is made up. Even microcomputers are not that fast!

Read the DIRECTIONS, and follow the WORKED EXAMPLE to see how it works. When you understand,

try the trick on a friend!

In this trick, you form an addition example. Some numbers will be given by you and some by your friend.

DIRECTIONS

1. Tell your friend that an addition example will be formed that you already know the answer to.

2 Ask your friend for a 2-digit number

3. You now know the answer! It is $200 + (\text{the number in step 2}) - 2$. Write down the answer on a separate piece of paper Fold it and hide it

4. Ask your friend for another 2-digit number. 5. Now you choose a number which with your friend's choice adds to 99.

6. Ask your friend for another 2-digit number. 7. Again, you choose a number which adds to 99 with your friend's choice.

8. Have your friend add up the five numbers. 9. Have your friend compare the answer with what you wrote on the folded paper

~ ~ ~ _ . ~ ~

For best effect, when you choose a number, pretend it is

a number even though it has to make '99'

Experiment with 3-digit numbers in the same way. Instead of the pairs adding to 99 they must add to 999!

Weird Subtraction

Are you bored with subtraction? Have you regrouped or borrowed once too often? If so, then have we got a method for you. You'll never have to subtract again! All you have to do is change a subtraction example to an addition example which will give the same answer. It's called the MAKE 9's METHOD and here's how it's done.

SUBTRACTION EXAMPLE ADDITION EXAMPLE
(with the same answer)

$$\begin{array}{r} 5212 \\ - 2865 \\ \hline 2347 \end{array} \quad \text{becomes} \quad \begin{array}{r} 5212 \\ + 7134 \\ \hline 12346 \end{array}$$

1 as 46
- al
2 3 4 7

Notice

$$\begin{aligned} 2 + 7 &= 9 \\ 8 + 1 &= 9 \\ 6 + 3 &= 9 \\ 5 + 4 &= 9 \end{aligned}$$

2865 becomes 7134.

No wonder it's called

- the MAKE 9's METHOD!

$$\begin{array}{r} 802 \\ - 173 \\ \hline \end{array}$$

$$629$$

Now it's your turn to write down a tough subtraction example. You'll find, the harder the subtraction question, the faster the MAKE 9's METHOD! Challenge a friend to a subtraction race.

Double Your Luck

Ask any of your friends if they have a lucky 3-digit number. (If they don't, have them make believe they do.)

Tell them, that if they will do three simple multiplications, you can double their luck!

1. Have them write down their lucky 3-digit number.
2. Multiply it by 7.
3. Multiply this result by 11.
4. Multiply this result by 13.

Does it make any difference in which order you multiply by 7, 11, and 13?

Can you find the single multiplier that will do the same job?

A Card Trick

Here's a card trick which is easy to do and which will amaze your friends.

To do this trick remove from a deck of cards the 10s and face cards.

Have a friend shuffle the deck thoroughly.

Next, your friend should choose two cards. After looking at both of them, your friend returns one of the cards to you. At this point, you and your friend each have a card. You may look at your card, but not your friend's.

Here are the directions. Ask your friend to:

- Multiply the number on his or her card by 2;
- Add 2 to this result;
- Multiply the latest result by 5.

Tell your friend the SPECIAL NUMBER for YOUR card. You get this number from the chart on the right. Ask your friend to subtract this special number from his or her answer.

Take back your friend's

1 a k e ~ B ~ ~ ~
~ ~

card and hold the two cards as shown.

The result should be your friend's final answer.

Now go out and amaze your friends with this trick!

What Day Is It?

Did you know that even without a calendar you can figure out what day in the week any date was, or will be?

For example, an interesting piece of history is that Neil Armstrong became the first human being to walk on the moon on July 20, 1969. Let's figure out what day in the week that was!

For July 20, 1969:

1. The last two digits of the year are .
2. Divide by 4. Reject the remainder .
3. The month number is
4. The day number
5. Add the above
6. Divide by 7. Note only the remainder

69
17
20
06
1

From the REMAINDER CHART below, we see that since the remainder is 1, Neil Armstrong first stepped on the moon on a Sunday!

This method will handle any date in the 1900s. The only catch is that if the date is a leap year in January or February, go back one day at the end.

1. Using this system, find the day in the week you were born.
2. Who else in the class was born the same day of the week?

Finding Out Somebody's Age

Do you know somebody who wants to keep his or her age a secret? Do you want a sure-fire method for finding it out? No problem!

Ask the person whose age you want to find these three questions:

- a. What is the remainder when your age is divided by 3?
- b. What is the remainder when your age is divided by 5?
- c. What is the remainder when your age is divided by 7?

Then you fill the answers in the AGE FORMULA!

First, let's work through an example: Suppose your teacher is 22 years old, let's see if the formula works.

Try this trick on yourself first in order to make sure you know how it works. Now you're ready to find the age of some innocent, unsuspecting person

The Magic Number

DIRECTIONS	EXAMPLE	ALGEBRA
1. Write down a 3-digit number with the digits all the same.	666	
2. Add the three digits.	$6 + 6 + 6 = 18$	
3. Divide the answer to step 1 by the answer to step 2.	$666 \div 18$	
4. <i>The answer is 37!</i>	37!	

Guess the Numbers

DIRECTIONS	EXAMPLE	ALGEBRA
1. Write down a number less than 10, and another number between 10 and 99.	5 and 28	
2. Add the numbers.	$5 + 28 = 33$	
4. Multiply the answer by 5.	$33 \times 5 = 165$	
5. Add the smaller chosen number.	$165 + 5 = 170$	
6. Multiply this sum by 2.	$170 \times 2 = 340$	
7. Subtract the smaller chosen number.	$340 - 5 = 335$	
8. <i>The two numbers are 5 and $33 - 5 = 28$.</i>		

Three Dice

DIRECTIONS	EXAMPLE	ALGEBRA
1. While your back is turned, a friend rolls three dice.	5, 4, 2	
2. Add up the three top numbers.	$5 + 4 + 2 = 11$	
3. Add the bottom number of any one of the dice to the answer.	$11 + 3 = 14$	
4. Roll this die again.	6	
5. Add this new top number to the total, and remember the answer.	$14 + 6 = 20$	
6. <i>Now turn around. Add 7 to the total of the three top numbers. Your answer will be your friend's answer!</i>	$(5 + 6 + 2) + 7 = 20$	

Birthday Magic!

DIRECTIONS	EXAMPLE	ALGEBRA
1. Write down the month and day of your birth, using numerals.	2 25	
2. Multiply the month number by 5.	$2 \times 5 = 10$	
3. Add 7.	$10 + 7 = 17$	
4. Multiply by 4.	$17 \times 4 = 68$	
5. Add 13.	$68 + 13 = 81$	
6. Multiply by 5.	$81 \times 5 = 405$	
7. Add the day number.	$405 + 25 = 430$	
8. At this point ask for your friend's answer.	430	
9. Now you subtract 205 from that answer.	$430 - 205 = 225$	

Time Travel

DIRECTIONS	EXAMPLE	ALGEBRA
1. Ask your friend for a 2-digit number.	71	
3. Write down the answer to $200 + (\text{the 2-digit number}) - 2$.	Write $200 + 71 - 2 = 269$	
4. Ask your friend for another 2-digit number.	34	
5. Now you choose a number which with your friend's choice adds to 99.	Choose $99 - 34 = 65$	
6. Ask your friend for another 2-digit number.	49	
7. Again, you choose a number which adds to 99 with your friend's choice.	Choose $99 - 49 = 50$	
8. Have your friend add up the five numbers.	$71 + 34 + 65 + 49 + 50 = 269$	
9. Have your friend compare the answer with what you wrote on the folded paper	They are the same!	

Comments

- For best effect, when you choose a number, pretend it is a random number even though it has to add to '99'
- You can also do this trick with 3-digit numbers. Just have the pairs of numbers add to 999 instead of 99.