

Superb Sums

1. Predict the Answer:

a)

| | | | |
|----|----|----|----|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 |

Rules:

- Circle any number
- Then cross off all of the other numbers in the same column and row as the number that you circled.
- repeat step 1 and 2 until you have 4 numbers

The sum of the 4 circled numbers is

Show your answer sheet to people around you. Have they chosen the same numbers? Have they gotten the same result? Can you explain what's going on?

b) If you ask your friends to play the same game with the table below, can you predict what sum they will get?

| | | | | |
|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 |

2. A Mind-Reader Computer Programme

Play this game a few times:

<http://www.cut-the-knot.org/Curriculum/Magic/MindReaderNine.shtml>

Can you explain what's going on?

3. Mixed-up Multiplication

In the product shown to the right, the letters *P* and *Q* represent different digits from 1 to 9. What are *P* and *Q*?

$$\begin{array}{r}
 P8 \\
 3Q \\
 \hline
 2730
 \end{array}$$

4. ABCD Addition

In the summation to the right, the letters A, B, C and D are unknown. If the sum is to work out, what must they be?

$$\begin{array}{r} ABCD \\ ABC \\ AB \\ + \underline{A} \\ \hline 2012 \end{array}$$

5. Different Division

Find all 2 digit numbers AB such that

$$AB \div 9 = B \text{ remainder } A.$$

6. Abracaddition

In the following addition, each letter stands for a different digit from 0-9. Find the digit corresponding to each letter.

$$\begin{array}{r} HOCUS \\ + POCUS \\ \hline PRESTO \end{array}$$

7. Dastardly Division

Find all 4 digit numbers $ABCD$ such that

$$ABCD \div ACC = 9 \text{ remainder } CCC$$

8. Playing with digits

- What is the sum of the digits of $111,111,111^2$? No calculators allowed!
- Find all 3 digit numbers which become 9 times smaller when you erase their middle digit.
- Find the five digit numbers whose digits are reversed on multiplying by 4.