

Worksheet: Basic operations

Here is a prototype problem. Given the three numbers a, b, c , what is the largest number you can build using the basic 5 arithmetic operations?

Problem: What is the largest number you can build with the three digits 2,2,2?

Examples are $2 * 2 * 2 = 8$ or $2 * 22 = 44$ or $2 * 2 + 2 = 6$ or $22/2 = 11$ or $2^{2*2} = 16$.

Problem: What is the largest number you can build with the numbers 3,3,3?

Problem: What is the largest number you can build with the numbers 4,4,4?

The next problem was in the news

Problem: What is the largest number you can build with the numbers 2,3,6?

Now build your own problem and as a research project find some general rules.

Problem: What is the largest number you can build with the numbers 9,9,9?

Problem: What is the largest number you can create with 4 digits 3?

Worksheet: A too easy task?

In [1], the following problem appeared in a 10th grade exam.

Problem: Find the largest 3 digit number using the digits 2,3,6.

The scandal was that it appeared too easy. (It is considered adequate for 7th grade).
Lets modify the problem

Problem: Find the largest number using the digits 2,3,6.

Lets try

$$6^{32} = 7958661109946400884391936$$

$$2^{63} = 9223372036854775808$$

$$3^{6^2} = 150094635296999121$$

$$3^{2^6} = 3433683820292512484657849089281$$

Actually, the largest number seems to have 219 digits! Find it.



References

- [1] Die Welt. Diese Aufgabe sollen in Berlin Zehntklässler lösen.
<https://www.welt.de/politik/deutschland/article156370855>, 2016.