

Examples S in Arithmetic 2

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Examples S

0. What is the biggest positive integer?
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5. What is the biggest nonzero integer?
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9. What is the smallest 5-digit integer where each digit has a different number?

Suggestions or Solutions To the Problems in the Examples S

0. What is the biggest positive integer?

A positive integer can be infinitely large. No matter how big positive integer we may come up with, we can still make the larger one. So there is no biggest positive integer.

1. What is the biggest negative integer?

The smaller the magnitude of a negative number is, the bigger the negative number is. Therefore, the biggest negative integer is -1.

2. What is the smallest negative integer?

The bigger the magnitude of a negative number is, the smaller the negative number is. A magnitude of an integer can be indefinitely large. Therefore, there is no smallest negative integer.

3. What is the smallest positive integer?

The smaller the magnitude of a positive number is, the smaller the positive number is. Therefore, the smallest positive integer is 1.

4. What is the smallest nonzero integer?

Nonzero integers are negative or positive. Negative integers are smaller than positive integers. We know that there is no smallest negative integer from the solution to the problem 2 above. Therefore, there is no smallest nonzero integer.

5. What is the biggest nonzero integer?

Nonzero integers are negative or positive. Positive integers are bigger than negative integers. We know that there is no biggest positive integer from the solution to the problem 0 above. Therefore, there is no biggest nonzero integer.

6. What is the biggest 5-digit integer?

Suppose that N is a 5-digit integer, and that $N = ABCDE$ where A , B , C , D , and E are the numbers in the digits.

For instance, A is the number in the 10000's digit, and E is the number in the 1's digit.

We know that the integer is positive, and that all numbers need to be the largest in all the digits.

So we can see that $A = B = C = D = E = 9$ if N is the biggest 5-digit integer.

Therefore, $N = 99999$.

7. What is the biggest 5-digit integer where each digit has a different number?

Suppose that N is a 5-digit integer, and that $N = ABCDE$ where A , B , C , D , and E are the numbers in the digits.

For instance, A is the number in the 10000's digit, and E is the number in the 1's digit.

We know that

- The integer is positive, and that all numbers need to be the largest in all the digits.
- Each of all the numbers has to be different from all the others.
- The higher digit has to have the larger number than any other number in all the lower digits.

So we can see that $A = 9$, $B = 8$, $C = 7$, $D = 6$, and $E = 5$ if N is the biggest 5-digit integer where each digit has a different number. Therefore, $N = 98765$.

8. What is the smallest 5-digit integer?

Suppose that N is a 5-digit integer, and that $N = ABCDE$ where A , B , C , D , and E are the numbers in the digits.

For instance, A is the number in the 10000's digit, and E is the number in the 1's digit.

We know that the integer is negative, and that all numbers need to be the largest in magnitude in all the digits.

So we can see that $A = B = C = D = E = 9$ if N is the biggest 5-digit integer.

Therefore, $N = -99999$.

What then, is the smallest 5-digit positive integer?

If the N is a 5-digit integer, then A is not zero but the smallest. Then, $A = 1$.

Also, we can see that all the other 4 digits have to be the smallest, and that they are all 0s.
Therefore, $N = 10000$

Note that we normally take 0 for a number that has only 1 digit, which is the 1's digit, and in which the number is 0.

9. What is the smallest 5-digit integer where each digit has a different number?

Suppose that N is a 5-digit integer, and that $N = ABCDE$ where A , B , C , D , and E are the numbers in the digits.

For instance, A is the number in the 10000's digit, and E is the number in the 1's digit.

We know these:

- The integer is negative, and that all numbers need to be the largest in all the digits if the integer is the smallest.
- Each of all the numbers has to be different from all the others.
- The higher digit has to have the larger number than any other number in all the lower digits.

So we can see that $A = 9$, $B = 8$, $C = 7$, $D = 6$, and $E = 5$ if N is the smallest 5-digit integer where each digit has a different number.

Therefore, $N = -98765$.

