Examples T in Arithmetic 2

Click this to start.

Examples T

0. What is the smallest integer that is greater than 0?

1. What is the largest integer that is less than 0?

2. What is the largest 6-digit integer?

3. What is the largest 6-digit integer that is less than 0?

4. What is the largest 6-digit integer where 2 digits have 0s?

5. What is the smallest 6-digit integer that is less than 0?

6. What is the smallest 6-digit integer that is greater than 0?

7. What is the smallest 6-digit integer where 2 digits are 0s?

8. What is the largest 6-digit integer where each nonzero digit has a different number and 2 digits have 0s?

9. What is the smallest 6-digit integer where all digits are different?

A. Find the smallest 6-digit integer where 4 digits are different, and 2 digits are 1s.

B. What is the sum of all 8-digit integers?

C. What is the sum of all 8-digit odd integers?

D. What is the sum of all 8-digit even integers?

Suggestions or Solutions
To the Problems in the Examples T

0. What is the smallest integer that is greater than 0?

It is the smallest positive integer, which is therefore, 1.

1. What is the largest integer that is less than 0?

It is the largest negative integer, which is thus, -1.

2. What is the largest 6-digit integer?

Assuming ***N*** is the integer we want, we can say that ***N*** is positive, and we want every digit in ***N*** to be the largest. And we know that the largest is 9. So ***N*** is 999999.

3. What is the largest 6-digit integer that is less than 0?

Assuming ***N*** is the integer we want, we can say first, that ***N*** is negative. And next, in negative integers, the smaller the digit, the larger the integer. So we want every digit in ***N*** to be the smallest. And we know that the smallest is 0. We know however, that the highest digit in ***N*** cannot be 0. So ***N*** is -100000.

4. What is the largest 6-digit integer where 2 digits have 0s?

Assuming ***N*** is the integer we want, we can say first, that ***N*** is positive. And next, in positive integers, the larger the digit, the larger the integer. We know however, two digits in ***N*** have to be 0s. So ***N*** is 999900.

5. What is the smallest 6-digit integer that is less than 0?

Assuming ***N*** is the integer we want, we can say first, that ***N*** is negative.
And next, in negative integers, the larger the digit, the smaller the integer.
So we want every digit in ***N*** to be the largest.
And we know that the largest is 9. So ***N*** is -999999.

6. What is the smallest 6-digit integer that is greater than 0?

Assuming ***N*** is the integer we want, we can say first, that ***N*** is positive.
And next, in positive integers, the smaller the digit, the smaller the integer.
So we want every digit in ***N*** to be the smallest. And we know that the smallest is 0.
We know however, that the highest digit in ***N*** cannot be 0. So ***N*** is 100000.

7. What is the smallest 6-digit integer where 2 digits are 0s?

Assuming ***N*** is the integer we want, we can say first, that ***N*** is negative.
And next, in negative integers, the larger the digit, the smaller the integer. We know however, two digits in ***N*** have to be 0s. So ***N*** is -999900.

8. What is the largest 6-digit integer where all nonzero digits are different, and 2 digits are 0s?

Assuming ***N*** is the integer we want, we can say first, that ***N*** is positive.
And next, in positive integers, the larger the digit, the larger the integer. We know however, all nonzero digits in ***N*** are different, and 2 digits are 0s. So ***N*** is 987600.

9. What is the smallest 6-digit integer where all digits are different?

Assuming ***N*** is the integer we want, we can say first, that ***N*** is negative.
And next, in negative integers, the larger the digit, the smaller the integer. We know however, all digits in ***N*** are different. So ***N*** is -987654.

A. Find the smallest 6-digit integer where 4 digits are different, and 2 digits are 1s.

Assuming ***N*** is the integer we want, we can say first, that ***N*** is negative.
And next, in negative integers, the larger the digit, the smaller the integer. We know however, 4 digits in ***N*** are different, two digits in ***N*** are 1s. So ***N*** is -987611.

B. What is the sum of all 8-digit integers?

The sum is 0. How come?

Among all the 8-digit integers, the number of ones positive is the same as the number of the ones negative. So the sum is 0. How come, though?

Assuming ***P*** is the sum of all the 8-digit integers positive, we get
***P* = 10000000 + 10000001 + 10000002 + … + 99999999**.

And assuming ***N*** is the sum of all the 8-digit integers negative, we get
***N* = -10000000 – 10000001 – 10000002 – … – 99999999**
= -(10000000 + 10000001 + 10000002 + … + 99999999), which is **–*P***.

So assuming ***S*** is the sum of all the 8-digit integers, we get ***S* = *P* + *N* = *P* – *P* = 0**.

(10000000 + 10000001 + … + 99999999) – (10000000 + 10000001 + … + 99999999)
= 10000000 + 10000001 + … + 99999999 – 10000000 – 10000001 – … – 99999999
= 10000000 – 10000000 + 10000001 – 10000001 + … + 99999999 – 99999999 = 0.

C. What is the sum of all 8-digit odd integers?

We know that every 8-digit integer has its negative. For instance, the negative of 23456789 is –23456789. We know that the sum of the two above is 0.
And for any integer odd, we can make a pair of two integers, one is positive, the other is negative, and both have the same absolute value. So the sum of the two in every pair is 0.
And thus, the sum of all the 8-digit odd integers is 0.

D. What is the sum of all 8-digit even integers?

We know that each of all the 8-digit integers has its negative.

For instance, -12345678 is the negative of 12345678, and the negative of -12345678 is 12345678. And in fact, we can make a pair of two numbers for every number, and if one is positive, the other is negative, and both have the same magnitude, that is, the same absolute value. So the sum of the two in each pair is 0.

What then, is the sum of all the 8-digit even integers?

We know we can make a pair of two integers for every integer, and if one is positive, the other is negative, and both have the same magnitude, that is, the same absolute value. So the sum of the two in each pair is 0. That is, the sum of the two in every pair is 0.
So the sum of all the 8-digit even integers is 0, too.

And of course, the sum of all ***n***-digit integers is 0, the sum of all ***n***-digit even integers is 0, and so is the sum of all ***n***-digit odd integers.