

Examples O in Arithmetic 2

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Examples O

0. Rearrange in ascending (increasing) order, the 4-digit numbers below.

7?52, 7?94, 79?6, 779?, 7?01, and 78?0, where ? = 0, 1, 2 . . . 8, or 9.

Substitute the question mark with the number assigned to the mark.

For instance, if ? = **0**, then,

7?52, 7?94, 79?6, 779?, 7?01, and 78?0 will be: **7052, 7094, 7906, 7790, 7001, and 7800.**

So next, rearranging them in ascending order, we get 7906, 7800, ...

0.A. ? = 0

0.B. ? = 1

0.C. ? = 2

0.D. ? = 3

0.E. ? = 4

0.F. ? = 5

0.G. ? = 6

0.H. ? = 7

0.I. ? = 8

0.J. ? = 9

1. Wily has his ID, which is a four-digit number. The number is less than 7000, and has 3, 5, 7, and 9 in each digit. The digits 5 and 9 are consecutive (next to each other), 3 and 5 are apart, and 3 and 7 are apart, too. What then is his ID number?

2. Suppose a company is getting paid \$7_40_5 a month, and out of the monthly income, the company is spending \$532758 a month. Then, answer the questions below.

2.A. How much at most, can the company save per month?

2.B. How much at least, can the company save per month?

3. We are given two sets of cards. And each set has 10 different cards, each of which has one of 0, 1, 2 . . . 8, and 9.

3.0. Find the biggest number we can make using 9 cards out of the 20 cards.

3.1. Suppose 9 cards have been removed from the 20 cards. What then can be the smallest number we can make using 8 cards from the 11 cards left?

4. Two people made numbers using number cards. Each was given two sets of cards. Each set has 10 different cards, each of which has one of 0, 1, 2 . . . 8, and 9. One person made a number 44 million less than the biggest number that can be made of 9 cards from the 20 cards. And the number made by the other person is 406 million and 400 bigger than the smallest number that can be made of 8 cards out of the 20 cards. What then is the difference between the two numbers made?

**Suggestions or Solutions
To the Problems in the Examples O**

0. Rearrange in ascending order, the 4-digit numbers below.

7?52, 7?94, 79?6, 779?, 7?01, and 78?0, where ? = 0, 1, 2 . . . 8, or 9.

0.A. ? = 0

7052, 7094, 7906, 7790, 7001, 7800. So we get 7906, 7800, 7790, 7094, 7052, 7001

0.B. ? = 1

7152, 7194, 7916, 7791, 7101, 7810. So we get 7916, 7810, 7791, 7194, 7152, 7101

0.C. ? = 2

7252, 7294, 7926, 7792, 7201, 7820. So we get: 7926, 7820, 7792, 7294, 7252, 7201

0.D. ? = 3

7352, 7394, 7936, 7793, 7301, 7830. So we get 7936, 7830, 7793, 7394, 7352, 7301

0.E. ? = 4

7452, 7494, 7946, 7794, 7401, 7840. So we get 7946, 7840, 7794, 7494, 7452, 7401

0.F. ? = 5

7552, 7594, 7956, 7795, 7501, 7850. So we get: 7956, 7850, 7795, 7594, 7552, 7501

0.G. ? = 6

7652, 7694, 7966, 7796, 7601, 7860. So we get 7966, 7860, 7796, 7694, 7652, 7601

0.H. ? = 7

7752, 7794, 7976, 7797, 7701, 7870. So we get 7976, 7870, 7797, 7794, 7752, 7701

0.I. ? = 8

7852, 7894, 7986, 7798, 7801, 7880. So we get: 7986, 7894, 7880, 7852, 7801, 7798

0.J. ? = 9

7952, 7994, 7996, 7799, 7901, 7890. So we get 7996, 7994, 7952, 7901, 7890, 7799

1. Wily has his ID, which is a four-digit number. The number is less than 7000, and has 3, 5, 7, and 9 in each digit. The digits 5 and 9 are consecutive (next to each other), 3 and 5 are apart, and 3 and 7 are apart, too. What then is his ID number?

To begin with, we know $ID < 7000$. So the highest digit ≤ 6 .

Next, each digit is one of 3, 5, 7 and 9. So the highest digit is 3 or 5.

Suppose first, the highest digit is 3. Then, the rest of the digits are 5, 7, and 9.

And we know 3 and 5 are apart, and 3 and 7 are apart, too.

So the ID can be 3957 or 3975.

Also, we know 5 and 9 are consecutive. So 5 and 9 have to be put this way: 59 or 95.

Thus, if the highest digit is 3, the ID has to be 3957.

Suppose next, the highest digit is 5. Then, the rest of the digits are 3, 7, and 9.

And we know 3 and 5 are apart, and 3 and 7 are apart, too.

So the ID can be 5793 only.

We know however, 5 and 9 have to be put this way only: 59 or 95.

So the highest digit cannot be 5.

Thus, the ID must be 3957.

2. Suppose a company is getting paid \$7_40_5 a month, and out of the monthly income, the company is spending \$532758 a month. Then, answer the questions below.

2.A. How much at most, can the company save per month?

The maximum that the company can get paid is \$794095. So the amount the company can save at most each month is $\$794095 - \$532758 = \$261337$.

2.B. How much at least, can the company save per month?

The minimum that the company can make is \$704005. So the amount the company can save at least each month is $\$704005 - \$532758 = \$171247$.

3. We are given two sets of cards. And each set has 10 different cards, each of which has one of 0, 1, 2 . . . 8, and 9.

3.0. Find the biggest number we can make using 9 cards out of the 20 cards.

The biggest is 998877665.

3.1. Suppose 9 cards have been removed from the 20 cards. What then, can be the smallest number we can make using 8 cards from the 11 cards left?

We don't know what 9 cards have been removed. We can see however, what 8 cards have to be used if we have to make the smallest of all the numbers that can be made using 8 cards. So it doesn't matter that we remove 9 cards or not.

What matters is that we use 8 cards among the 20 cards.

So the smallest number that can be made is 00112233, which is 112233.

4. Two people made numbers using number cards. Each was given two sets of cards. Each set has 10 different cards, each of which has one of 0, 1, 2 . . . 8, and 9. One person made a number 44 million less than the biggest number that can be made of 9 cards from the 20 cards. And the number made by the other person is 406 million and 400 bigger than the smallest number that can be made of 8 cards out of the 20 cards. What then is the difference between the two numbers made?

The biggest number that can be made of 9 cards is 998877665.

So the number made by one of the two people is $998877665 - 44000000 = 954877665$.

Next, the smallest number that can be made of 8 cards is 00112233, which is 112233.

So the number made by the other person is $112233 + 406000400 = 406112633$.

Thus, the difference is $954877665 - 406112633 = 548765032$.