

Forming Numbers When a Digit Repeats

Unit: Number System & Notation - Student Practice Worksheet

Overview: Ms. Rao's practice sheet said: use four digits, repeat one of them once, build a 5-digit number. Digits 7, 5, 4, 1 — repeat one digit exactly one time. Greatest: repeat the biggest digit at the next higher place; smallest: repeat the smallest at the highest place you can.

Practice Questions (30 Total)

Section A - Easy

Q1. Using 7, 5, 4, 1 with one digit repeated once, what is the greatest 5-digit number?

- ☐ A. 77,541
- ☐ B. 75,471
- ☐ C. 74,571
- ☐ D. 71,457

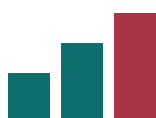
Q2. Does repeating a digit change the METHOD used to form the greatest or smallest number?

- ☐ A. Yes, repeats need a completely different rule
- ☐ B. Only if there are exactly two repeats
- ☐ C. No, the same descending/ascending method still applies
- ☐ D. Only for the smallest number, not the greatest

Q3. Using 6, 6, 2, 9, form the greatest number. Work it out.

- ☐ A. 9662
- ☐ B. 2669
- ☐ C. 6962
- ☐ D. 9626

Q4. The table shows 0, 0, 5, 3 again. Using it, what is the greatest number?



The table shows 0, 0, 5, 3 a

- ☐ A. 0053

- ☐ B. 5300
- ☐ C. 5030
- ☐ D. 3500

Q5. Ms. Rao's rule says to 'treat every copy of a repeated digit as its own separate digit to place.' What does this mean you should do with a digit like 6 that appears twice in a set?

- ☐ A. Combine the two 6s into a single 12
- ☐ B. Move both 6s to the very end regardless of order
- ☐ C. Sort each 6 individually, exactly as if they were two different digits
- ☐ D. Only use one of the 6s and ignore the other

Q6. Using 5, 5, 5, 1, form the smallest number. Work it out.

- ☐ A. 5551
- ☐ B. 5155
- ☐ C. 5515
- ☐ D. 1555

Q7. The table shows 4, 4, 0, 7 -- one zero. Using it, what is the smallest number?

The table shows 4, 4, 0, 7 -

- ☐ A. 0447
- ☐ B. 4047
- ☐ C. 4407
- ☐ D. 4074

Q8. Ms. Rao says 'the zero rule still applies even when there are two zeros.' What does the zero rule say?

- ☐ A. A number can never end with the digit zero
- ☐ B. Two zeros always cancel each other out
- ☐ C. Zero must always be the last digit sorted
- ☐ D. A number can never start with the digit zero

Q9. Using 8, 8, 2, 2, form the smallest number. Work it out.

- ☐ A. 2288
- ☐ B. 8822
- ☐ C. 2828
- ☐ D. 8228

Q10. The table shows 6, 6, 2, 9. Using it, work out the smallest number.

- ☐ A. 9662
- ☐ B. 2669
- ☐ C. 2696
- ☐ D. 6269

Section B - Medium

Q11. The table shows 0, 0, 0, 6 -- three zeros. Using it, what is the smallest 4-digit number?

The table shows 0, 0, 0, 6 -

then compare

- ☐ A. 6000
- ☐ B. 0006
- ☐ C. 0060
- ☐ D. 0600

Q12. When forming the smallest number, why does only ONE non-zero digit ever need to move to the front, no matter how many zeros are in the set?

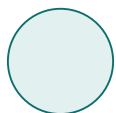
- ☐ A. Because only the leading position has the zero restriction -- every other position sorts normally, including zeros
- ☐ B. Because all non-zero digits must move to the front
- ☐ C. Because zeros are removed from the number entirely
- ☐ D. Because the rule only works for exactly two zeros

Q13. Using 7, 7, 3, 3, find the difference between the greatest and smallest numbers formed. Work it out.

- ☐ A. 4444
- ☐ B. 4346
- ☐ C. 4356

☐ D. 4256

Q14. The table shows 0, 2, 2, 5 -- one zero. Using it, what is the smallest 4-digit number?



The table shows 0, 2, 2, 5 -

☐ A. 0225

☐ B. 2205

☐ C. 2052

☐ D. 2025

Q15. A digit set has one non-zero digit and three zeros, such as 8, 0, 0, 0. If you tried to make the smallest number start with a zero, what would go wrong?

☐ A. The zeros would need to be removed from the set

☐ B. It would actually be a number with fewer digits, since a leading zero doesn't count

☐ C. The number would become negative

☐ D. Nothing would go wrong -- zero can lead just fine

Q16. Using 6, 6, 6, 0, form the greatest 4-digit number. Work it out.

☐ A. 0666

☐ B. 6660

☐ C. 6606

☐ D. 6066

Q17. The table shows 0, 0, 3, 3 -- two zeros. Using it, what is the smallest 4-digit number?



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The table shows 0, 0, 3, 3 -

☐ A. 0033

☐ B. 3030

☐ C. 3003

☐ D. 0303

Q18. When forming the GREATEST number from a set that includes zeros, like 5, 0, 0, 3, could the number ever accidentally start with a zero the way the smallest number can?

- ☐ **A.** Yes, if there are more zeros than non-zero digits
- ☐ **B.** Yes, always, since descending order still includes zeros
- ☐ **C.** It depends on how many zeros are in the set
- ☐ **D.** No -- descending order always places the largest available digit first, and zero is never the largest

Q19. Using 9, 9, 0, 1, form the smallest 4-digit number. Work it out.

- ☐ **A.** 1099
- ☐ **B.** 0199
- ☐ **C.** 1909
- ☐ **D.** 1990

Q20. The table shows 2, 2, 0, 0. Using it, work out the greatest 4-digit number.

- ☐ **A.** 0022
- ☐ **B.** 2200
- ☐ **C.** 2020
- ☐ **D.** 0220

Section C - Challenge

Q21. The table shows 0, 0, 0, 5, 5 -- three zeros. Using it, what is the smallest 5-digit number?



The table shows 0, 0, 0, 5,

- ☐ **A.** 50005
- ☐ **B.** 00055
- ☐ **C.** 50050
- ☐ **D.** 05005

Q22. A student says the greatest number from 3, 3, 3, 3 and the smallest number from 3, 3, 3, 3 must be different. Is this correct?

- ☐ **A.** Yes, greatest is 3333 and smallest is 3330
- ☐ **B.** No — both are 3333, since every digit is identical

- ☐ C. Yes, greatest is 3333 and smallest is 0333
- ☐ D. It cannot be determined

Q23. Using 0, 0, 0, 5, 5, form the greatest 5-digit number. Work it out.

- ☐ A. 50500
- ☐ B. 55000
- ☐ C. 50050
- ☐ D. 50005

Q24. The table shows 0, 0, 1, 1, 9 -- two zeros. Using it, what is the smallest 5-digit number?

The table shows 0, 0, 1, 1,



- ☐ A. 00119
- ☐ B. 10091
- ☐ C. 11009
- ☐ D. 10019

Q25. How is forming the smallest number different when there are TWO zeros in the set, compared to just one zero?

- ☐ A. Only one zero is allowed to be used
- ☐ B. The number must then start with a zero anyway
- ☐ C. The rule cannot be applied when there is more than one zero
- ☐ D. Both zeros slide in right after the leading non-zero digit, in order

Q26. Using 0, 0, 1, 1, 9, form the greatest 5-digit number. Work it out.

- ☐ A. 91100
- ☐ B. 91010
- ☐ C. 90011
- ☐ D. 91001

Q27. The table shows 0, 0, 4, 4, 4 -- two zeros. Using it, what is the smallest 5-digit number?



The table shows 0, 0, 4, 4,

- ☐ A. 00444
- ☐ B. 40404
- ☐ C. 40044
- ☐ D. 44004

Q28. A set of 5 digits has three zeros and two different non-zero digits, 2 and 7. Without listing the digits in a table, describe how you'd find the smallest 5-digit number.

- ☐ A. The smaller non-zero digit (2) leads, then all three zeros slide in, then the remaining non-zero digit (7)
- ☐ B. All three zeros lead, since there are more zeros than any other digit
- ☐ C. The larger non-zero digit (7) must always lead
- ☐ D. It cannot be formed, since there are too many zeros

Q29. Using 0, 1, 1, 1, 1, form the smallest 5-digit number. Work it out.

- ☐ A. 10111
- ☐ B. 01111
- ☐ C. 11101
- ☐ D. 11011

Q30. The table shows 1, 1, 2, 2. Using it, find the difference between the greatest and smallest numbers formed.

- ☐ A. 909
- ☐ B. 1010
- ☐ C. 990
- ☐ D. 899

Answer Key

Q1: (A) (a) 77,541. Place 7, repeat 7 once, then 5, 4, 1.

Q2: (C) (c) No, the same descending/ascending method still applies. Each copy of a repeated digit is sorted just like any other digit.

Q3: (A) (a) 9662. Descending order of all four digits, including both 6s.

Q4: (B) (b) 5300. Descending order: 5, 3, then both zeros -- zeros are fine anywhere except leading.

Q5: (C) (c) Sort each 6 individually, exactly as if they were two different digits. A repeated digit gets no special treatment -- every copy is placed on its own.

Q6: (D) (d) 1555. The 1 leads, then all three 5s follow in ascending order.

Q7: (B) (b) 4047. Ascending would start with 0, so the smallest non-zero digit (4) leads instead, then 0, then the remaining 4, then 7.

Q8: (D) (d) A number can never start with the digit zero. That's why the smallest non-zero digit has to lead instead, no matter how many zeros are in the set.

Q9: (A) (a) 2288. Both 2s come first in ascending order, then both 8s.

Q10: (B) (b) 2669. Sort the table's digits ascending: 2, 6, 6, 9.

Q11: (A) (a) 6000. The only non-zero digit, 6, must lead since a number cannot start with 0, and the three zeros fill the rest.

Q12: (A) (a) Only the leading position is restricted; every other position, including the zeros, still sorts by its normal ascending/descending rule.

Q13: (C) (c) 4356. Greatest is 7733, smallest is 3377, and 7733 minus 3377 is 4356.

Q14: (D) (d) 2025. Ascending would start with 0, so one 2 leads instead, then 0, then the other 2, then 5.

Q15: (B) (b) It would actually be a number with fewer digits, since a leading zero doesn't count. That's exactly what happened with 0053 in the story -- it's really just 53.

Q16: (B) (b) 6660. Descending order places all three 6s first, and the 0 lands last, which is allowed.

Q17: (C) (c) 3003. One 3 leads instead of 0, then both zeros slide in, then the remaining 3.

Q18: (D) (d) No -- descending order always places the largest available digit first, and zero is never the largest. The leading-zero problem only threatens the smallest number, never the greatest.

Q19: (A) (a) 1099. 1 leads since 0 can't, then 0 slides in, then both 9s follow in ascending order.

Q20: (B) (b) 2200. Sort the table's digits descending: 2, 2, then both zeros -- zeros are fine anywhere except leading.

Q21: (A) (a) 50005. A 5 must lead since a number cannot start with 0, then the three zeros fill next, then the remaining 5.

Q22: (B) (b) No — both are 3333, since every digit is identical. Sorting an all-identical set in either direction gives the same result.

Q23: (B) (b) 55000. Both 5s come first in descending order, and all three zeros trail behind, which is allowed there.

Q24: (D) (d) 10019. One 1 leads instead of 0, then both zeros slide in, then the remaining 1, then 9.

Q25: (D) (d) Both zeros slide in right after the leading non-zero digit, in order. The same single rule — zero cannot lead — applies no matter how many zeros are present.

Q26: (A) (a) 91100. Descending order: 9, 1, 1, 0, 0.

Q27: (C) (c) 40044. One 4 leads instead of 0, then both zeros slide in, then the remaining two 4s.

Q28: (A) (a) The smaller non-zero digit, 2, leads, then all three zeros slide in, then the remaining non-zero digit, 7 -- giving 20077.

Q29: (A) (a) 10111. One 1 leads instead of 0, then 0 slides in, then the remaining three 1s.

Q30: (C) (c) 990. From the table's digits: greatest is 2211, smallest is 1122, and 2211 minus 1122 is 990.

You've got this! Keep learning and shining! - Ruchi Math Coaching