

Forming the Greatest and Smallest Number

Unit: Number System & Notation - Student Practice Worksheet

Overview: Ms. Rao gave Anaya and Kabir the same four digits — 7, 2, 9, 4 — and asked for the biggest possible number, no calculator allowed. Kabir shuffled the digits until one 'looked' biggest. Anaya wrote hers down in one try and never changed it. She hadn't guessed. She had sorted.

Practice Questions (30 Total)

Section A - Easy

Q1. The table shows 5, 3, 8, 1 sorted descending. Using it, what is the greatest number?

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The table shows 5, 3, 8, 1 s

- ☐ A. 8531
- ☐ B. 1358
- ☐ C. 8513
- ☐ D. 3581

Q2. To form the greatest number from a set of digits, arrange them in ____ order.

- ☐ A. Descending
- ☐ B. Ascending
- ☐ C. Random
- ☐ D. Alphabetical

Q3. Using 5, 3, 8, 1 once each, form the smallest number. Work it out.

- ☐ A. 8531
- ☐ B. 1358
- ☐ C. 3158
- ☐ D. 1538

Q4. The table shows 7, 0, 5, 2 -- one of them is a zero. Using it, what is the smallest number?



The table shows 7, 0, 5, 2 -

- ☐ A. 0257
- ☐ B. 7520
- ☐ C. 2057
- ☐ D. 2075

Q5. To form the smallest number from a set of digits (no zero involved), arrange them in ____ order.

- ☐ A. Descending
- ☐ B. Ascending
- ☐ C. Reverse
- ☐ D. Random

Q6. Using 6, 2, 9, 4 once each, form the greatest number. Work it out.

- ☐ A. 2469
- ☐ B. 9624
- ☐ C. 9642
- ☐ D. 6942

Q7. The table shows 4, 8, 1, 6 sorted descending. Using it, what is the greatest number?

The table shows 4, 8, 1, 6 s

- ☐ A. 8641
- ☐ B. 1468
- ☐ C. 8614
- ☐ D. 6841

Q8. Which digit can never be the leading digit of a number formed this way?

- ☐ A. 9

- ☐ B. 1
- ☐ C. 5
- ☐ D. 0

Q9. Using 6, 2, 9, 4 once each, form the smallest number. Work it out.

- ☐ A. 9642
- ☐ B. 2649
- ☐ C. 4269
- ☐ D. 2469

Q10. The table shows 4, 8, 1, 6. Using it, work out the smallest number.

- ☐ A. 8641
- ☐ B. 1468
- ☐ C. 1486
- ☐ D. 4168

Section B - Medium

Q11. The table shows 0, 3, 6, 9 -- one of them is a zero. Using it, what is the greatest number?

The table shows 0, 3, 6, 9 -

then compare

- ☐ A. 9603
- ☐ B. 0369
- ☐ C. 9630
- ☐ D. 6930

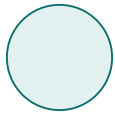
Q12. Anaya sorts the digits before writing the number, instead of trying random orders like Kabir did at first. Why does sorting always work while random guessing might not?

- ☐ A. Sorting applies the rule systematically, guaranteed correct
- ☐ B. Random guessing is actually faster in every case
- ☐ C. Sorting only works for numbers with 4 digits or fewer
- ☐ D. Both methods are equally reliable

Q13. Using 1, 2, 3, 4, 5 once each, form the greatest 5-digit number. Work it out.

- ☐ A. 54321
- ☐ B. 12345
- ☐ C. 53421
- ☐ D. 45321

Q14. The table shows 0, 2, 4, 6, 8 -- one of them is a zero. Using it, what is the greatest number?



The table shows 0, 2, 4, 6,

- ☐ A. 08246
- ☐ B. 86240
- ☐ C. 86420
- ☐ D. 68420

Q15. If two of the digits you're given are the same, like 5, 5, 3, 1, does the descending-order rule for the greatest number still apply?

- ☐ A. Yes -- equal digits are simply placed next to each other in the same descending order
- ☐ B. No -- repeated digits break the rule entirely
- ☐ C. Only the ascending-order rule works when digits repeat
- ☐ D. Repeated digits must be removed before sorting

Q16. Using 1, 2, 3, 4, 5 once each, form the smallest 5-digit number. Work it out.

- ☐ A. 54321
- ☐ B. 12345
- ☐ C. 13245
- ☐ D. 21345

Q17. The table shows 3, 0, 6 -- one of them is a zero. Using it, what is the smallest 3-digit number?



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The table shows 3, 0, 6 -- o

- ☐ A. 036

- ☐ B. 306
- ☐ C. 360
- ☐ D. 603

Q18. In the story, Kabir's first guess for the greatest number using 7, 2, 9, 4 was 9724, not 9742. What kind of mistake was this?

- ☐ A. He placed two digits (2 and 4) in the wrong relative order instead of fully sorting descending
- ☐ B. He used the wrong four digits entirely
- ☐ C. He formed the smallest number instead of the greatest
- ☐ D. There was no mistake -- both answers are equally correct

Q19. Using 0, 2, 4, 6, 8 once each, form the smallest 5-digit number. Work it out.

- ☐ A. 02468
- ☐ B. 24068
- ☐ C. 20648
- ☐ D. 20468

Q20. The table shows 2, 5, 7, 9. Using it, find the difference between the greatest and smallest numbers formed.

- ☐ A. 3273
- ☐ B. 3153
- ☐ C. 3183
- ☐ D. 3173

Section C - Challenge

Q21. The table shows 0, 1, 2, 3, 4, 5 -- one of them is a zero. Using it, what is the greatest 6-digit number?



The table shows 0, 1, 2, 3,

- ☐ A. 012345
- ☐ B. 543210
- ☐ C. 543201
- ☐ D. 534210

Q22. Kabir claims that in the greatest-number arrangement, swapping the last two (smallest) digits will always make the number smaller, as long as those two digits are different. Is he right?

- ☐ A. No, it makes no difference
- ☐ B. Yes, always true for distinct digits
- ☐ C. It depends only on where the zero is
- ☐ D. It only works for 3-digit numbers

Q23. Using 1, 3, 5, 7, 9 once each, find the difference between the greatest and smallest 5-digit numbers formed. Work it out.

- ☐ A. 83952
- ☐ B. 83942
- ☐ C. 84952
- ☐ D. 83852

Q24. The table shows the same digits 0, 1, 2, 3, 4, 5. Using it, what is the smallest 6-digit number?

The table shows the same dig



- ☐ A. 012345
- ☐ B. 120345
- ☐ C. 102345
- ☐ D. 103245

Q25. Anaya says the same sorting rule works no matter how many digits you're given -- 3, 6, or 10 -- as long as none of them is zero. Is she right?

- ☐ A. Yes -- the reasoning (the biggest digit deserves the biggest place) doesn't depend on how many digits there are
- ☐ B. No -- the rule only works for numbers up to 5 digits
- ☐ C. No -- the rule reverses once there are more than 6 digits
- ☐ D. Only if the digits are already sorted to begin with

Q26. Using digits 9, 0, 5, 2, 7 once each, form the smallest 5-digit number. Work it out.

- ☐ A. 02579

- ☐ B. 20759
- ☐ C. 25079
- ☐ D. 20579

Q27. The table shows 2, 0, 6, 4, 8 -- one of them is a zero. Using it, what digit sits in the ten-thousands place of the greatest 5-digit number formed?



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The table shows 2, 0, 6, 4,

- ☐ A. 6
- ☐ B. 4
- ☐ C. 8
- ☐ D. 2

Q28. In forming a number with one digit's position already fixed (like the thousands digit), why does the sorting rule still apply to the REMAINING digits?

- ☐ A. Because place value still works the same way for whatever positions remain open
- ☐ B. Because the fixed digit cancels the rule for the rest of the number
- ☐ C. Because you should ignore place value once one digit is fixed
- ☐ D. The rule doesn't apply -- remaining digits go in their original order

Q29. Using digits 9, 0, 5, 2, 7 once each, form the greatest 5-digit number. Work it out.

- ☐ A. 97520
- ☐ B. 97502
- ☐ C. 79520
- ☐ D. 95720

Q30. The table shows digits 4, 9, 7, 1, with 4 fixed in the thousands place. Using it, form the greatest possible number.

- ☐ A. 4917
- ☐ B. 4719
- ☐ C. 9471
- ☐ D. 4971

Answer Key

- Q1:** (A) (a) 8531. Sort the table's digits descending: 8, 5, 3, 1.
- Q2:** (A) (a) Descending. The biggest digit goes in the biggest place value.
- Q3:** (B) (b) 1358. Arrange the digits in ascending order: 1, 3, 5, 8.
- Q4:** (C) (c) 2057. Ascending order would be 0257, but 0 can't lead, so 2 leads and 0 slides in next.
- Q5:** (B) (b) Ascending. The smallest digit goes in the biggest place value.
- Q6:** (C) (c) 9642. Descending order: 9, 6, 4, 2.
- Q7:** (A) (a) 8641. Sort the table's digits descending: 8, 6, 4, 1.
- Q8:** (D) (d) 0. A leading zero doesn't count, so it would shorten the number.
- Q9:** (D) (d) 2469. Ascending order: 2, 4, 6, 9.
- Q10:** (B) (b) 1468. Sort the table's digits ascending: 1, 4, 6, 8.
- Q11:** (C) (c) 9630. Descending order: 9, 6, 3, 0. Zero is fine in the last place -- it only can't lead.
- Q12:** (A) (a) Sorting applies the rule systematically, so it always lands on the correct answer -- guessing might stumble onto it, or might not.
- Q13:** (A) (a) 54321. Descending order of all five digits.
- Q14:** (C) (c) 86420. Descending order: 8, 6, 4, 2, 0 -- the zero naturally lands last, where it does no harm.
- Q15:** (A) (a) Yes. Sorting descending still works with repeats -- 5,5,3,1 sorted descending is still 5531, the greatest possible arrangement.
- Q16:** (B) (b) 12345. Ascending order of all five digits.
- Q17:** (B) (b) 306. Ascending would be 036, but 0 can't lead, so 3 leads and 0 slides into the next place.
- Q18:** (A) (a) He swapped 2 and 4's order -- close to fully sorted, but not quite, which is exactly why guess-and-check is less reliable than sorting every digit.
- Q19:** (D) (d) 20468. 2 leads instead of 0, then 0 slides in, then 4, 6, 8 follow in order.
- Q20:** (D) (d) 3173. From the table's digits: greatest is 9752, smallest is 2579, and 9752 minus 2579 is 3173.
- Q21:** (B) (b) 543210. Descending order of all six digits, zero landing last.
- Q22:** (B) (b) Yes, always true for distinct digits. Swapping the smaller digit before the larger one in the last two places always reduces the number.
- Q23:** (A) (a) 83952. Greatest is 97531, smallest is 13579, and 97531 minus 13579 is 83952.
- Q24:** (C) (c) 102345. 1 leads instead of 0, then 0 slides in, then 2, 3, 4, 5 follow in order.
- Q25:** (A) (a) Yes. The rule comes from place value itself -- the leftmost place is always worth the most, whatever the number's length -- so descending order works for any count of digits, exactly as the concept states.

Q26: (D) (d) 20579. Ascending would start with 0, so 2 leads instead, then 0, 5, 7, 9 follow in order.

Q27: (C) (c) 8. The greatest number is 86420, so the biggest digit, 8, leads in the ten-thousands place.

Q28: (A) (a) Place value is unchanged for the remaining open positions, so descending/ascending order still gives the greatest/smallest arrangement of whatever digits are left.

Q29: (A) (a) 97520. Descending order: 9, 7, 5, 2, 0.

Q30: (D) (d) 4971. With 4 fixed first (per the table), arrange the remaining 9, 7, 1 in descending order after it.

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