

Number Play: Chapter Practice and Revision

Unit: Number Play - Student Practice Worksheet

Overview: Ms. Rao mixed together every Number Play idea from the whole chapter into one revision sheet: patterns, primes, palindromes, digit sums, and supercells, all shuffled up. Kabir panicked at first, thinking he needed a whole new set of rules to solve it. Then he realised: it wasn't new maths at all — it was every idea he already knew, just recognising which tool fit which question.

Practice Questions (30 Total)

Section A - Easy

Q1. Add the five digit boxes. What is the digit sum of 47,382?

4	7	3	8	2
---	---	---	---	---

- ☐ A. 24
- ☐ B. 20
- ☐ C. 28
- ☐ D. 47382

Q2. What does a revision sheet mainly practise?

- ☐ A. Learning entirely new rules
- ☐ B. Recognising which known tool a question needs
- ☐ C. Memorising answers without understanding
- ☐ D. Only arithmetic speed

Q3. Starting from 5, what's the first Collatz step?

- ☐ A. 2.5
- ☐ B. 10
- ☐ C. 15
- ☐ D. 16

Q4. The two teal boxes of 131 match. Is 131 a palindrome?



- ☐ **A.** No
- ☐ **B.** Yes
- ☐ **C.** Only if reversed
- ☐ **D.** Cannot be checked

Q5. What is the Kaprekar constant for 4-digit numbers?

- ☐ **A.** 6174
- ☐ **B.** 1729
- ☐ **C.** 9999
- ☐ **D.** 1000

Q6. Find the digit sum of 131.

- ☐ **A.** 3
- ☐ **B.** 131
- ☐ **C.** 13
- ☐ **D.** 5

Q7. The teal 9 sits between 2 and 4. Is 9 a supercell?



- ☐ **A.** No, since $9 < 10$
- ☐ **B.** Cannot be determined
- ☐ **C.** Yes, since $9 > 2$ and $9 > 4$
- ☐ **D.** Only if it's first

Q8. Is 47,382 a palindrome?

- ☐ **A.** Yes
- ☐ **B.** No

- ☐ C. Only its digit sum is
- ☐ D. Cannot be checked

Q9. Starting from 16, list the next Collatz steps down to 4.

- ☐ A. 8, 4
- ☐ B. 32, 64
- ☐ C. 15, 14
- ☐ D. 48, 4

Q10. In the row 6, 2, 9, 4, 7, is 2 a supercell?

- ☐ A. Yes
- ☐ B. Cannot be determined
- ☐ C. No, since $2 < 6$ and $2 < 9$
- ☐ D. Only sometimes

Section B - Medium

Q11. Which numbers are the teal supercells in this row?

6	2	9	4	7
---	---	---	---	---

- ☐ A. 6, 9, and 7
- ☐ B. 2 and 4
- ☐ C. Only 9
- ☐ D. All five numbers

Q12. A revision question asks for the digit sum AND whether the number is a palindrome. What is being tested?

- ☐ A. Only one skill, repeated twice
- ☐ B. A brand-new combined rule
- ☐ C. Neither skill actually applies here
- ☐ D. Two separate skills on the same number

Q13. Apply one Kaprekar round to 3524 (largest arrangement minus smallest). What is the result?

- ☐ A. 0
- ☐ B. 3087
- ☐ C. 2979
- ☐ D. 2187

Q14. The teal box names the 4-digit Kaprekar fixed point. What number is it?

6174

- ☐ A. 1000
- ☐ B. 9999
- ☐ C. 6174
- ☐ D. 0

Q15. Why is 4 NOT a supercell in 6, 2, 9, 4, 7?

- ☐ A. Because $4 < 9$ and $4 < 7$
- ☐ B. Because 4 is even
- ☐ C. Because 4 is not the last cell
- ☐ D. Because 4 is smaller than 6

Q16. Find the digit sum of 6174 and check if it is divisible by 3.

- ☐ A. 17, not divisible
- ☐ B. 20, not divisible
- ☐ C. 6, divisible
- ☐ D. 18, yes divisible by 3

Q17. This Collatz path starts at 5. How many steps does it take to reach 1?

$5 \rightarrow 16 \rightarrow 8 \rightarrow 4 \rightarrow 2 \rightarrow 1$

- ☐ A. 6 steps
- ☐ B. 4 steps
- ☐ C. 5 steps
- ☐ D. 1 step

Q18. Why might mixed revision become faster than single-topic sheets with practice?

- ☐ A. Mixed sheets are always mathematically easier
- ☐ B. Recognising the right tool becomes automatic
- ☐ C. It's purely random which is faster
- ☐ D. Chapter-specific sheets always have more questions

Q19. What is the digit sum of the Kaprekar-process result 3087?

- ☐ A. 18
- ☐ B. 12
- ☐ C. 24
- ☐ D. 3087

Q20. Kabir writes a 3-digit palindrome using the digits 4 and 7. Which is a valid example?

- ☐ A. 447
- ☐ B. 474
- ☐ C. 744
- ☐ D. 477

Section C - Challenge

Q21. 747 matches from both ends. Its digits also sum to 18. What does that show?



- ☐ A. 121 (sum 4) is the only such number
- ☐ B. 747 is a palindrome whose digit sum divides by 9
- ☐ C. 123 is a palindrome
- ☐ D. 900 is a palindrome

Q22. Why is a mixed revision sheet better practice than five separate single-topic sheets?

- ☐ A. It forces recognising which tool applies
- ☐ B. It contains completely different mathematical content

- ☐ C. Mixed sheets are always shorter
- ☐ D. There is no real advantage either way

Q23. In the row 6, 2, 9, 4, 7, find the sum of the supercell values 6, 9, and 7.

- ☐ A. 19
- ☐ B. 13
- ☐ C. 6
- ☐ D. 22

Q24. One Kaprekar round on 3524 is shown. What is $5432 - 2345$?

$$5432 - 2345 = 3087$$

- ☐ A. 0
- ☐ B. 3087
- ☐ C. 2979
- ☐ D. 2187

Q25. How is the Kaprekar constant different from the Collatz Conjecture in proof status?

- ☐ A. Both are equally unproven
- ☐ B. Kaprekar is proven; Collatz is not
- ☐ C. Both are fully proven for all numbers
- ☐ D. Neither has ever been tested at all

Q26. Can a palindrome still fail the divisibility-by-3 test? Check 121.

- ☐ A. No, all palindromes divide by 3
- ☐ B. Only even palindromes can fail
- ☐ C. Yes — 121 sums to 4, not a multiple of 3
- ☐ D. This situation is impossible

Q27. A revision question says 'find the digit sum of every supercell' on this row. What two skills does that combine?

6	2	9	4	7
---	---	---	---	---

- ☐ A. Palindrome-checking and Collatz
- ☐ B. Only one skill, repeated
- ☐ C. Find supercells, then add those values
- ☐ D. Neither skill from this chapter

Q28. Why keep Collatz and supercells SEPARATE unless a question links them?

- ☐ A. All Number Play concepts are the same rule
- ☐ B. Supercells and Collatz always apply together
- ☐ C. There is no reason to keep them separate
- ☐ D. Mixing unasked rules answers a question nobody asked

Q29. Why does the 4-digit Kaprekar process stop changing rather than looping through many values?

- ☐ A. It has been proven to reach 6174
- ☐ B. It never actually terminates
- ☐ C. It terminates only for even starting numbers
- ☐ D. It always terminates at 0

Q30. What is the single most important skill a mixed Number Play revision sheet is designed to build?

- ☐ A. Memorising every possible number fact by heart
- ☐ B. Reading a question carefully enough to pick the right method
- ☐ C. Solving every question as fast as possible without reading
- ☐ D. Avoiding any question that mixes more than one idea

Answer Key

- Q1:** (A) (a) 24 . $4+7+3+8+2=24$.
- Q2:** (B) (b) Recognising which known tool a question needs.
- Q3:** (D) (d) 16 . 5 is odd, so $5 \times 3 + 1 = 16$.
- Q4:** (B) (b) Yes. 131 reads the same forwards and backwards.
- Q5:** (A) (a) 6174 . The famous 4-digit Kaprekar constant.
- Q6:** (D) (d) 5 . $1+3+1=5$.
- Q7:** (C) (c) Yes, since $9 > 2$ and $9 > 4$.
- Q8:** (B) (b) No. Reversed, it reads $28,374$.
- Q9:** (A) (a) 8 , 4 . $16/2=8$, $8/2=4$.
- Q10:** (C) (c) No, since 2 loses to both neighbors.
- Q11:** (A) (a) 6 , 9 , and 7 — each beats its immediate neighbor(s).
- Q12:** (D) (d) Two separate, unrelated skills applied to the same number.
- Q13:** (B) (b) 3087 . $5432-2345=3087$.
- Q14:** (C) (c) 6174 . The Kaprekar constant.
- Q15:** (A) (a) Because 4 loses to both immediate neighbors 9 and 7 .
- Q16:** (D) (d) 18 , yes. $6+1+7+4=18$, a multiple of 3 .
- Q17:** (C) (c) 5 steps. $5 \rightarrow 16 \rightarrow 8 \rightarrow 4 \rightarrow 2 \rightarrow 1$ is five transitions.
- Q18:** (B) (b) Recognising the right tool quickly becomes automatic.
- Q19:** (A) (a) 18 . $3+0+8+7=18$.
- Q20:** (B) (b) 474 . It reads the same both ways. 747 would also work, but is not listed.
- Q21:** (B) (b) 747 is a palindrome and $7+4+7=18$, divisible by 9 . (252 also works; it is not listed.)
- Q22:** (A) (a) It forces recognising WHICH tool applies, not just executing a known one on cue.
- Q23:** (D) (d) 22 . $6+9+7=22$.
- Q24:** (B) (b) 3087 .
- Q25:** (B) (b) Kaprekar is proven for 4-digit numbers; Collatz remains a conjecture.
- Q26:** (C) (c) Yes. Palindrome and digit-sum tests are independent. $1+2+1=4$.
- Q27:** (C) (c) Supercell identification, then adding $6+9+7$.
- Q28:** (D) (d) Recognising which tool applies also means recognising which tools do not.
- Q29:** (A) (a) It has been proven to reach the fixed point 6174 and stay there.
- Q30:** (B) (b) Reading a question precisely enough to identify which known method applies.

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