Gauss Technique — Practice

CKSTEM Math Problem Solving · Grades 4–7

1 PAIR-AND-EQUALISE (EVEN N)

A reading log records 1 page on day 1, 2 pages on day 2, and so on, up to 6 pages on day 6. How many pages were read in total?

WORK IT OUT HERE

2 PAIR-AND-EQUALISE (EVEN N)

A bakery stacks loaves so the bottom row has 1 loaf, the next row has 2 loaves, and so on up to a tenth row with 10 loaves. How many loaves are stacked in all?

WORK IT OUT HERE

3 PAIR-AND-EQUALISE (EVEN N)

A relay club logs 1 lap on the first day, 2 laps on the second, and continues that way until 20 laps on the twentieth day. How many laps were logged in total?

WORK IT OUT HERE

4 PAIR-AND-EQUALISE (GENERAL STEP)

A clothing donation bin fills up over four weeks with 4, 6, 8, and 10 coats. How many coats were collected in all?

WORK IT OUT HERE

5 PAIR-AND-EQUALISE (GENERAL STEP)

A community garden harvests six baskets of tomatoes weighing 5, 8, 11, 14, 17, and 20 pounds. What is the total weight?

WORK IT OUT HERE

6 PAIR-AND-EQUALISE (GENERAL STEP)

A library shelves new arrivals in eight stacks of 12, 19, 26, 33, 40, 47, 54, and 61 books. How many new books are there in all?

WORK IT OUT HERE

7 GAUSS PAIRING (ODD N)

A fundraiser stacks five jars holding 6, 10, 14, 18, and 22 marbles. How many marbles are there altogether?

WORK IT OUT HERE

8 GAUSS PAIRING (ODD N)

A pet rescue logs seven days of food deliveries totalling 9, 14, 19, 24, 29, 34, and 39 cans per day. How many cans were delivered in all?

WORK IT OUT HERE

9 GAUSS PAIRING (ODD N)

A choir lines up nine rows of risers holding 8, 13, 18, 23, 28, 33, 38, 43, and 48 singers. How many singers are on the risers in total?

WORK IT OUT HERE

10 RECOVER N FIRST

A walk-a-thon raises 5 dollars on the first lap and 3 more dollars on each lap after that, ending at 32 dollars on the final lap. How much was raised in total?

WORK IT OUT HERE

11 RECOVER N FIRST

A school recycling program collects 6 kilograms in its first week and 4 more kilograms each week after that, ending with 50 kilograms in the final week. How many kilograms were collected in all?

WORK IT OUT HERE

12 RECOVER N FIRST

An after-school club sells 8 raffle tickets on day 1 and 7 more tickets each day after that, finishing with 99 tickets on the last day. How many tickets were sold across all the days?

WORK IT OUT HERE

13 SLICE = BIG SUM − SMALL SUM

A children's hospital sends k thank-you cards on day k for every day. How many cards are sent from day 10 through day 20?

WORK IT OUT HERE

14 SLICE = BIG SUM − SMALL SUM

A community kitchen serves k meals on day k for every day of the year. How many meals are served from day 25 through day 40?

WORK IT OUT HERE

15 SLICE = BIG SUM − SMALL SUM

A volunteer reading group reads k pages aloud on day k. How many pages are read from day 50 through day 75?

WORK IT OUT HERE

16 REPEATING BLOCK INVARIANT

A bookstore tracks daily inventory change. On odd-numbered days it gains 5 books; on even-numbered days it loses 2 books. The pattern continues for 24 days. What is the net change in inventory after 24 days?

WORK IT OUT HERE

17 REPEATING BLOCK INVARIANT

A weather station logs the daily change in water depth (cm). The first eight days read: +6, +8, −5, −3, +6, +8, −5, −3. The same daily pattern continues for 40 days. What is the total change after 40 days?

WORK IT OUT HERE

18 REPEATING BLOCK INVARIANT

A reservoir logs daily change in water units. The first twelve days read: +1, +4, +7, −2, −5, −8, +1, +4, +7, −2, −5, −8. The same pattern continues for 60 days. What is the total change after 60 days?

WORK IT OUT HERE

Answer Key

Each answer comes with a hint that names the move. The tag says which video to rewatch if you are stuck.

1. 21 pages — *Pair-and-Equalise (even n)*
Pair the first day with the last day; both ends together give one constant pair-sum that you can count.

2. 55 loaves — *Pair-and-Equalise (even n)*
Pair the bottom row with the top row; each outer pair adds to the same total.

3. 210 laps — *Pair-and-Equalise (even n)*
Pair the first day with the last day; count how many of those equal pairs fit, then multiply.

4. 28 coats — *Pair-and-Equalise (general step)*
Pair the first week with the last week; every outer pair adds to the same total.

5. 75 pounds — *Pair-and-Equalise (general step)*
Match the lightest basket with the heaviest; the matched pair-total stays the same as you move inward.

6. 292 books — *Pair-and-Equalise (general step)*
Pair the smallest stack with the largest; count the equal pairs, then multiply by the constant pair-sum.

7. 70 marbles — *Gauss Pairing (odd n)*
Pair the outer jars; the middle jar has no partner, so add it on by itself.

8. 168 cans — *Gauss Pairing (odd n)*
Pair the first day with the last day for the constant pair-sum; the middle day rides along on its own.

9. 252 singers — *Gauss Pairing (odd n)*
First with last gives the pair-sum; the lone middle row adds straight in.

10. 185 dollars — *Recover n First*
First find how many laps there were by counting steps from start to finish, then add one for the starting lap.

11. 336 kilograms — *Recover n First*
Recover the number of weeks from start, end, and step (plus one for the starting week) before you pair-and-equalise.

12. 749 tickets — *Recover n First*
Use last minus first, divide by step, plus one for the day count; then apply pair-and-equalise.

13. 165 cards — *Slice = Big Sum − Small Sum*
Take the full Gauss sum up to the last day and subtract the Gauss sum up to the day before the first day.

14. 520 meals — *Slice = Big Sum − Small Sum*
Compute the big Gauss sum to the end day; subtract the smaller Gauss sum to one day before the start.

15. 1625 pages — *Slice = Big Sum − Small Sum*
Slice equals the full Gauss sum to the last day minus the Gauss sum to the day before the slice begins.

16. 36 books — *Repeating Block Invariant*
Sum one two-day block once, then multiply by how many of those blocks fit in the full stretch.

17. 60 masks — *Repeating Block Invariant*
Look at the first few days — when do they start repeating? Add ONE full cycle, then multiply by how many cycles fit in 40 days.

18. −30 units — *Repeating Block Invariant*

Spot the repeating cycle in the first few days; sum one full cycle, then multiply by how many cycles fit in 60 days.