

Sum of Consecutive Natural Numbers

Unit: Number Play - Student Practice Worksheet

Overview: Pixel gave Anaya and Kabir sixty seconds to add up every whole number from 1 to 15. Kabir started adding one by one: $1+2=3$, $3+3=6$, $6+4=10$... he ran out of time at 11. Anaya wrote one line, did one multiplication, and was done before he finished counting on his fingers.

Practice Questions (30 Total)

Section A - Easy

Q1. Five pair-boxes each total 11. What is the sum from 1 to 10?

$1+10$

$2+9$

$3+8$

$4+7$

$5+6$

Five pairs of 11

- ☐ A. 55
- ☐ B. 50
- ☐ C. 45
- ☐ D. 60

Q2. What is the formula for the sum of the first n natural numbers?

- ☐ A. $n \times n$
- ☐ B. $n / 2$
- ☐ C. $n \times (n+1) / 2$
- ☐ D. $n + 1$

Q3. What is the sum of natural numbers from 1 to 5?

- ☐ A. 10
- ☐ B. 15
- ☐ C. 20
- ☐ D. 25

Q4. The diagram shows 7 pairs of 16 plus the leftover middle 8. What total is that for 1 to 15?

$$7 \text{ pairs} \times 16 = 112$$

$$+ \text{ middle } 8$$

$$\text{total} = 120$$

- ☐ A. 105
- ☐ B. 112
- ☐ C. 130
- ☐ D. 120

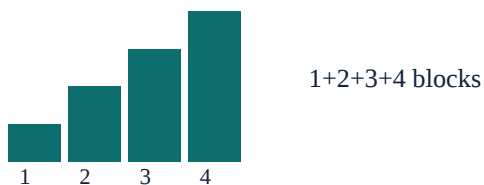
Q5. Who is credited with discovering the pairing trick for summing numbers, as a child?

- ☐ A. Pythagoras
- ☐ B. Euclid
- ☐ C. Newton
- ☐ D. Gauss

Q6. What is the sum of natural numbers from 1 to 20?

- ☐ A. 190
- ☐ B. 210
- ☐ C. 200
- ☐ D. 220

Q7. Count the staircase blocks from 1 up to 4. How many blocks in all?



- ☐ A. 8
- ☐ B. 12
- ☐ C. 10
- ☐ D. 16

Q8. In Anaya's pairing method for 1 to 15, what does each pair (like 1+15 or 2+14) add up to?

- ☐ A. 16
- ☐ B. 15
- ☐ C. 14
- ☐ D. 30

Q9. What is the sum of natural numbers from 1 to 6?

- ☐ A. 21
- ☐ B. 18
- ☐ C. 15
- ☐ D. 24

Q10. Use $n(n+1)/2$ with $n=8$, then check $1+2+\dots+8$. What is the sum from 1 to 8?

- ☐ A. 32
- ☐ B. 36
- ☐ C. 40
- ☐ D. 30

Section B - Medium

Q11. The card shows 50 pairs that each make 101. What is the sum from 1 to 100?

$$1 + 100 = 101$$

x 50 pairs

Gauss sum from 1 to 100

- ☐ A. 5050
- ☐ B. 5000
- ☐ C. 10100
- ☐ D. 4950

Q12. How many pairs did Anaya form when summing 1 to 15, and what was left over?

- ☐ A. 8 pairs, with nothing left over
- ☐ B. 15 pairs, with 1 left over
- ☐ C. 7 pairs, with 8 left over in the middle

- ☐ D. 7 pairs, with 1 left over

Q13. What is the sum of natural numbers from 1 to 50?

- ☐ A. 1250
- ☐ B. 1275
- ☐ C. 2500
- ☐ D. 1300

Q14. The strip says $n(n+1)/2 = 105$. Which whole number n fits?

$$\boxed{n \times (n+1)} / 2 = 105$$

try $n=14$: $14 \times 15 / 2$

- ☐ A. 14
- ☐ B. 15
- ☐ C. 13
- ☐ D. 16

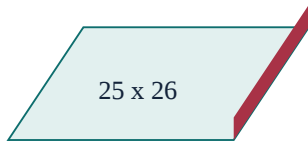
Q15. Why does Kabir's one-by-one addition take longer than Anaya's method for large n ?

- ☐ A. His method is actually faster for large n
- ☐ B. Both methods take exactly the same time always
- ☐ C. He must perform n additions, while the formula uses just one multiplication and one division
- ☐ D. Addition is always faster than multiplication

Q16. What is the sum of natural numbers from 1 to 12?

- ☐ A. 72
- ☐ B. 84
- ☐ C. 66
- ☐ D. 78

Q17. The tilted slab is 25 by 26. Halve that product. What is the sum from 1 to 25?



halve that product

- ☐ A. 300
- ☐ B. 350
- ☐ C. 312
- ☐ D. 325

Q18. In the pairing method for 1 to n , what does each pair always add up to?

- ☐ A. $n + 1$
- ☐ B. n
- ☐ C. $2n$
- ☐ D. $n - 1$

Q19. What is the sum of natural numbers from 1 to 30?

- ☐ A. 450
- ☐ B. 465
- ☐ C. 480
- ☐ D. 900

Q20. Pair 1 with 40 (each pair 41) and also use the formula. What is the sum from 1 to 40?

- ☐ A. 800
- ☐ B. 820
- ☐ C. 840
- ☐ D. 780

Section C - Challenge

Q21. Read $200 \times 201 / 2$ from the three boxes. What is the sum from 1 to 200?

200	x	201	/ 2
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- ☐ A. 20,100
- ☐ B. 20,000
- ☐ C. 19,900
- ☐ D. 40,200

Q22. Kabir claims doubling n always exactly doubles the sum of 1 to n . Test this: is $\text{sum}(1 \text{ to } 20)$ equal to 2 times $\text{sum}(1 \text{ to } 10)$?

- ☐ A. Yes, both equal 110
- ☐ B. Yes, both equal 210
- ☐ C. No — 210 does not equal 110
- ☐ D. The comparison cannot be made

Q23. What is the sum of natural numbers from 11 to 20 (not starting from 1)?

- ☐ A. 165
- ☐ B. 155
- ☐ C. 145
- ☐ D. 210

Q24. The lower bar is twice the 1-to-15 bar. What is the sum of the first 15 even numbers?

1 to 15 = 120

evens 2 to 30 = twice as long

- ☐ A. 225
- ☐ B. 240
- ☐ C. 120
- ☐ D. 255

Q25. Why is Gauss's pairing trick considered elegant rather than just a shortcut?

- ☐ A. It only works for exactly the number 100
- ☐ B. It reveals a hidden structure — a fixed pair-sum — rather than merely speeding up repeated addition
- ☐ C. It avoids using any numbers at all
- ☐ D. It requires a calculator to apply

Q26. What is the sum of natural numbers from 21 to 30?

- ☐ A. 245
- ☐ B. 265
- ☐ C. 255
- ☐ D. 300

Q27. The hollow circle is 15, left off the 1-to-15 sum. How much too small is the total?



15 left out

- ☐ A. 15
- ☐ B. 14
- ☐ C. 1
- ☐ D. 8

Q28. A runner adds 1 to 15 twice by mistake (summing the whole range, then accidentally summing it again and adding both totals). What is their final wrong total?

- ☐ A. 240
- ☐ B. 120
- ☐ C. 135
- ☐ D. 360

Q29. What is the sum of natural numbers from 1 to 99?

- ☐ A. 4,900
- ☐ B. 5,000
- ☐ C. 4,851
- ☐ D. 4,950

Q30. The formula $n(n+1)/2$ equals 210. Which n matches, and how do you check it?

- ☐ A. 21
- ☐ B. 19
- ☐ C. 22
- ☐ D. 20

Answer Key

Q1: (A) (a) 55. Using $n(n+1)/2$ with $n=10$: $10 \times 11 / 2 = 55$.

Q2: (C) (c) $n \times (n+1) / 2$.

Q3: (B) (b) 15. Using $n(n+1)/2$ with $n=5$: $5 \times 6 / 2 = 15$.

Q4: (D) (d) 120. Using $n(n+1)/2$ with $n=15$: $15 \times 16 / 2 = 120$.

Q5: (D) (d) Gauss.

Q6: (B) (b) 210. Using $n(n+1)/2$ with $n=20$: $20 \times 21 / 2 = 210$.

Q7: (C) (c) 10. Using $n(n+1)/2$ with $n=4$: $4 \times 5 / 2 = 10$.

Q8: (A) (a) 16. Each pair is one number plus its opposite-end partner, always giving $n+1 = 16$.

Q9: (A) (a) 21. Using $n(n+1)/2$ with $n=6$: $6 \times 7 / 2 = 21$.

Q10: (B) (b) 36. Using $n(n+1)/2$ with $n=8$: $8 \times 9 / 2 = 36$.

Q11: (A) (a) 5050. Using $n(n+1)/2$ with $n=100$: $100 \times 101 / 2 = 5050$.

Q12: (C) (c) 7 pairs, with 8 left over in the middle. 15 is odd, so one number sits alone in the middle, unpaired.

Q13: (B) (b) 1275. Using $n(n+1)/2$ with $n=50$: $50 \times 51 / 2 = 1275$.

Q14: (A) (a) 14. Check: $14 \times 15 / 2 = 105$.

Q15: (C) (c) He must perform n additions, while the formula uses just one multiplication and one division. The gap grows larger as n grows.

Q16: (D) (d) 78. Using $n(n+1)/2$ with $n=12$: $12 \times 13 / 2 = 78$.

Q17: (D) (d) 325. Using $n(n+1)/2$ with $n=25$: $25 \times 26 / 2 = 325$.

Q18: (A) (a) $n + 1$. The smallest plus the largest, and every such pair, always totals $n+1$.

Q19: (B) (b) 465. Using $n(n+1)/2$ with $n=30$: $30 \times 31 / 2 = 465$.

Q20: (B) (b) 820. Using $n(n+1)/2$ with $n=40$: $40 \times 41 / 2 = 820$.

Q21: (A) (a) 20,100. Using $n(n+1)/2$ with $n=200$: $200 \times 201 / 2 = 20,100$.

Q22: (C) (c) No — $\text{sum}(1 \text{ to } 20)=210$, but $2 \times 55=110$, so the claim is false. The sum formula grows roughly with the square of n , not linearly, so doubling n does not simply double the sum.

Q23: (B) (b) 155. Take (sum of 1 to 20) minus (sum of 1 to 10): 210 minus 55 equals 155.

Q24: (B) (b) 240. Doubling every term in 1 to 15 doubles the total too: $2 \times 120 = 240$.

Q25: (B) (b) It reveals a hidden structure — a fixed pair-sum — rather than merely speeding up repeated addition. Seeing that every pair totals the same amount is the real insight behind the formula, not just a faster way to count.

Q26: (C) (c) 255. Take (sum of 1 to 30) minus (sum of 1 to 20): 465 minus 210 equals 255.

Q27: (A) (a) 15. Leaving out the number 15 makes the total exactly 15 less than the correct sum of 120.

Q28: (A) (a) 240. Two copies of the correct sum, 120, add up to 240.

Q29: (D) (d) 4,950. Using $n(n+1)/2$ with $n=99$: $99 \times 100 / 2 = 4,950$.

Q30: (D) (d) 20. Check: $20 \times 21 / 2 = 210$.

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