Sum of Even Numbers

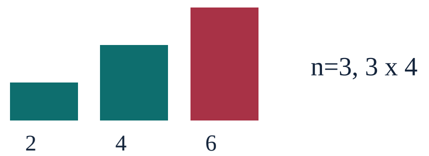
Unit: Number Play - Student Practice Worksheet

Overview: Pixel asked for the sum of the first 6 even numbers: 2+4+6+8+10+12. Kabir started adding left to right, term after term. Anaya multiplied two numbers together and was done.

Practice Questions (30 Total)

Section A - Easy

Q1. The three bars are 2, 4 and 6. What is their total?



- [ ] **A.** 12
- [ ] **B.** 10
- [ ] **C.** 14
- [ ] **D.** 8

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

- [ ] **A.** n x n
- [ ] **B.** n / 2
- [ ] **C.** n x (n+1)
- [ ] **D.** 2n + 1

Q3. What is the sum of the first 4 even numbers, 2+4+6+8?

- [ ] **A.** 18
- [ ] **B.** 20
- [ ] **C.** 16
- [ ] **D.** 24

Q4. The five even bars grow by 2 each time. What is 2+4+6+8+10?

- [ ] **A.** 30
- [ ] **B.** 25
- [ ] **C.** 35
- [ ] **D.** 28

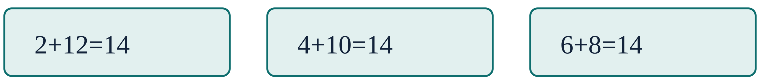
Q5. The sum of the first n even numbers is exactly what, compared to the sum of the first n natural numbers?

- [ ] **A.** Half of it
- [ ] **B.** The same
- [ ] **C.** Triple it
- [ ] **D.** Double it

Q6. What is the sum of the first 7 even numbers?

- [ ] **A.** 56
- [ ] **B.** 49
- [ ] **C.** 48
- [ ] **D.** 63

Q7. Three pair-boxes each show 14. What is the sum of the first 6 even numbers?



3 pairs of 14

- [ ] **A.** 36
- [ ] **B.** 40
- [ ] **C.** 48
- [ ] **D.** 42

Q8. Which of these is the 6th even number in the sequence 2, 4, 6, 8, 10, 12?

- [ ] **A.** 10

- [ ] **B.** 12
- [ ] **C.** 14
- [ ] **D.** 6

Q9. What is the sum of the first 3 even numbers, 2+4+6?

- [ ] **A.** 10
- [ ] **B.** 9
- [ ] **C.** 12
- [ ] **D.** 8

Q10. Add 2+4, then check n(n+1) with n=2. What is the sum of the first 2 even numbers?

- [ ] **A.** 8
- [ ] **B.** 6
- [ ] **C.** 4
- [ ] **D.** 10

Section B - Medium

Q11. The two boxes are n=10 and n+1=11. What product is the sum of the first 10 even numbers?

$\boxed{n=10}$ x $\boxed{n+1=11}$

- [ ] **A.** 110
- [ ] **B.** 100
- [ ] **C.** 120
- [ ] **D.** 90

Q12. How does pairing 2 with 12, 4 with 10, and 6 with 8 (for the first 6 even numbers) help find the sum?

- [ ] **A.** Each pair totals 14; 3 pairs give 42
- [ ] **B.** It shows the sum must be zero
- [ ] **C.** It only works if there are exactly 4 terms
- [ ] **D.** The pairs are all unequal, so no shortcut exists

Q13. What is the sum of the first 20 even numbers?

- [ ] **A.** 400
- [ ] **B.** 420
- [ ] **C.** 440
- [ ] **D.** 380

Q14. The tilted slab is 25 by 26. What is the sum of the first 25 even numbers?

25 x 26

- [ ] **A.** 625
- [ ] **B.** 600
- [ ] **C.** 675
- [ ] **D.** 650

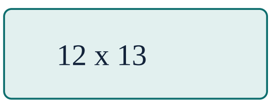
Q15. If the sum of the first n even numbers is 90, what is n?

- [ ] **A.** 10
- [ ] **B.** 8
- [ ] **C.** 9
- [ ] **D.** 11

Q16. What is the sum of the first 15 even numbers?

- [ ] **A.** 225
- [ ] **B.** 240
- [ ] **C.** 230
- [ ] **D.** 250

Q17. The card shows 12 x 13. What is the sum of the first 12 even numbers?



first 12 evens

- [ ] **A.** 144

- [ ] **B.** 168
- [ ] **C.** 132
- [ ] **D.** 156

Q18. If the sum of the first n even numbers is 132, what is n?

- [ ] **A.** 11
- [ ] **B.** 12
- [ ] **C.** 10
- [ ] **D.** 13

Q19. The 8th even number is 16. What is the sum of the first 8 even numbers?

- [ ] **A.** 64
- [ ] **B.** 80
- [ ] **C.** 72
- [ ] **D.** 56

Q20. Use n(n+1) with n=9, and check by doubling 1+...+9. What is the sum of the first 9 even numbers?

- [ ] **A.** 81
- [ ] **B.** 90
- [ ] **C.** 100
- [ ] **D.** 72

Section C - Challenge

Q21. The card shows 50 x 51. What is the sum of the first 50 even numbers?

50 x 51

first 50 evens

- [ ] **A.** 2,550
- [ ] **B.** 2,500
- [ ] **C.** 2,600
- [ ] **D.** 5,050

Q22. Compare the sum of the first n even numbers, n(n+1), with the sum of the first n odd numbers, n squared. Which is bigger for the same n?

- ☐ **A.** The odd-number sum is always bigger
- ☐ **B.** They are always exactly equal
- ☐ **C.** It depends on whether n is even or odd
- ☐ **D.** The even-number sum is always bigger, by exactly n

Q23. What is the sum of the even numbers from 20 to 30 (that is, 20, 22, 24, 26, 28, 30)?

- ☐ **A.** 140
- ☐ **B.** 150
- ☐ **C.** 160
- ☐ **D.** 130

Q24. The card shows 30 x 31. What is the sum of the first 30 even numbers?

30 x 31

- ☐ **A.** 930
- ☐ **B.** 900
- ☐ **C.** 960
- ☐ **D.** 870

Q25. A student sums the first 10 even numbers but accidentally includes 0 as well (0+2+4+...+20). How does this change their total?

- ☐ **A.** It doubles the total
- ☐ **B.** It doesn't change the total, since 0 adds nothing
- ☐ **C.** It reduces the total by 10
- ☐ **D.** It makes the total impossible to compute

Q26. What is the last (nth) even number when the sum of the first n even numbers equals 240?

- ☐ **A.** 32
- ☐ **B.** 28
- ☐ **C.** 30

- [ ] **D.** 16

Q27. The line runs from even 2 to even 100 (50 terms). What is that sum?

- [ ] **A.** 2,500
- [ ] **B.** 5,050
- [ ] **C.** 2,450
- [ ] **D.** 2,550

Q28. Why is n x (n+1) always an even number itself, for any whole number n?

- [ ] **A.** One of the two consecutive numbers is always even
- [ ] **B.** Because n is always even
- [ ] **C.** Because n+1 is always odd
- [ ] **D.** It is not always true

Q29. If the sum of the first n even numbers is 600, what is n?

- [ ] **A.** 25
- [ ] **B.** 23
- [ ] **C.** 24
- [ ] **D.** 30

Q30. Why must 2 x [n(n+1)/2] match the even-sum formula n(n+1)?

- [ ] **A.** They only agree for even values of n
- [ ] **B.** The 2 and the division by 2 cancel out, leaving n(n+1) exactly
- [ ] **C.** They never actually agree
- [ ] **D.** The 2 multiplies the whole expression again, giving 4 times n(n+1)

Answer Key

Q1: (A) (a) 12. Using n(n+1) with n=3: 3 x 4 = 12.

Q2: (C) (c) n x (n+1).

Q3: (B) (b) 20. Using n(n+1) with n=4: 4 x 5 = 20.

Q4: (A) (a) 30. Using n(n+1) with n=5: 5 x 6 = 30.

Q5: (D) (d) Double it. Every even number is 2 times a counting number.

Q6: (A) (a) 56. Using n(n+1) with n=7: 7 x 8 = 56.

Q7: (D) (d) 42. Using n(n+1) with n=6: 6 x 7 = 42.

Q8: (B) (b) 12. The 6th even number is 2 x 6 = 12.

Q9: (C) (c) 12. Using n(n+1) with n=3: 3 x 4 = 12.

Q10: (B) (b) 6. Using n(n+1) with n=2: 2 x 3 = 6.

Q11: (A) (a) 110. Using n(n+1) with n=10: 10 x 11 = 110.

Q12: (A) (a) Each pair totals 14, and there are 3 such pairs, giving 3x14=42.

Q13: (B) (b) 420. Using n(n+1) with n=20: 20 x 21 = 420.

Q14: (D) (d) 650. Using n(n+1) with n=25: 25 x 26 = 650.

Q15: (C) (c) 9. Check: 9 x 10 = 90.

Q16: (B) (b) 240. Using n(n+1) with n=15: 15 x 16 = 240.

Q17: (D) (d) 156. Using n(n+1) with n=12: 12 x 13 = 156.

Q18: (A) (a) 11. Check: 11 x 12 = 132.

Q19: (C) (c) 72. Using n(n+1) with n=8: 8 x 9 = 72.

Q20: (B) (b) 90. Using n(n+1) with n=9: 9 x 10 = 90.

Q21: (A) (a) 2,550. Using n(n+1) with n=50: 50 x 51 = 2,550.

Q22: (D) (d) The even-number sum is always bigger, by exactly n. n(n+1) minus n squared equals n.

Q23: (B) (b) 150. Pairing 20+30=50, 22+28=50, 24+26=50, giving 3 pairs of 50, plus none left over (all 6 terms paired): 3x50=150.

Q24: (A) (a) 930. Using n(n+1) with n=30: 30 x 31 = 930.

Q25: (B) (b) It doesn't change the total at all, since adding 0 makes no difference. 0 is the identity for addition.

Q26: (C) (c) 30. n=15 (since 15x16=240), and the 15th even number is 2x15=30.

Q27: (D) (d) 2,550. There are 50 even numbers from 2 to 100, so use n(n+1) with n=50: 50 x 51 = 2,550.

Q28: (A) (a) Because n and n+1 are consecutive, so one of them is always even, making their product even. This matches the sum of even numbers always being even, as expected.

Q29: (C) (c) 24. Check: 24 x 25 = 600.

Q30: (B) (b) The 2 and the division by 2 cancel out, leaving n(n+1) exactly. This is why the two derivations of the formula always match.

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