LESSON MAKER PRO

Series Sum Sprint

Use first terms, last terms, and term counts to find totals.

HIGH SCHOOL · MA.912.AR.10.3

MA.912.AR.10.3 "Recognize and apply the formula for the sum of a finite arithmetic series to solve mathematical and real-world problems."

NAME _____ DATE _____

ADD A FINITE SERIES

For an arithmetic series, use $S_n = n/2(a_1 + a_n)$, where n is the number of terms, a_1 is the first term, and a_n is the last term. If you do not know the last term, find it with $a_n = a_1 + (n - 1)d$. This formula pairs the first and last terms to find the total efficiently.

WORKED EXAMPLE

Find the sum: $7 + 12 + 17 + 22 + 27$

1. There are $n = 5$ terms.
2. Use $S_n = n/2(a_1 + a_n)$.
3. $S_5 = 5/2(7 + 27) = 5/2(34) = 85$.

Answer: 85

PRACTICE 6 problems

1 Find the sum: $3 + 6 + 9 + \ldots + 30$

ANSWER _____

2 An arithmetic series has first term 8, common difference 4, and 9 terms. Find its sum.

ANSWER _____

3 Find the sum of the first 11 terms of an arithmetic sequence with first term 2 and common difference 3.

ANSWER _____

4 Find the sum: $14 + 20 + 26 + \ldots + 74$

ANSWER _____

5 An arithmetic series has first term 6, last term 66, and 11 terms. Find its sum.

ANSWER _____

6 Find the sum: $40 + 36 + 32 + \ldots + 20$

ANSWER _____

APPLY IT Show your work

1 A student club sells stickers at 8 school events. It sells 16 stickers at the first event and 6 more stickers at each event after that. How many stickers does the club sell in all?

WORK SPACE

ANSWER _____

2 In a game-design tournament, a player earns 14 points in the first round. The player earns 4 more points than the round before in each new round, for 10 rounds. How many points does the player earn altogether?

WORK SPACE

ANSWER _____

CHALLENGE One step up

An arithmetic series begins with 10 and has a common difference of 6. Its sum is 248. How many terms are in the series? Show an equation that supports your answer.

WORK SPACE AND ANSWER

ANSWER KEY

Series Sum Sprint

HIGH SCHOOL · MA.912.AR.10.3

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the sum: 3 + 6 + 9 + ... + 30	**165**
2	An arithmetic series has first term 8, common difference 4, and 9 terms. Find its sum.	**216**
3	Find the sum of the first 11 terms of an arithmetic sequence with first term 2 and common difference 3.	**187**
4	Find the sum: 14 + 20 + 26 + ... + 74	**484**
5	An arithmetic series has first term 6, last term 66, and 11 terms. Find its sum.	**396**
6	Find the sum: 40 + 36 + 32 + ... + 20	**180**

PART 2 · APPLY IT

1. **296 stickers** The last event has 58 stickers sold. Use $S_8 = 8/2(16 + 58) = 296$.
2. **320 points** The tenth-round score is 50 points. Use $S_{10} = 10/2(14 + 50) = 320$.

CHALLENGE

8 terms

Accept equivalent arithmetic-series formulas and correct sums with appropriate units. For the challenge, accept n = 8 with a valid equation such as n/2[20 + 6(n - 1)] = 248.