LESSON MAKER PRO

Sum It Up

Turn a list of terms into one sigma expression.

HIGH SCHOOL · A.SSE.B.4.a

A.SSE.B.4.a "Express the sums in a series using sigma notation."

NAME _____ DATE _____

FIND THE PATTERN

Sigma notation uses Σ to show that you are adding terms. Write a rule for each term, then choose limits that make the rule produce the first and last terms in the sum.

WORKED EXAMPLE

Express 19 + 38 + 57 + 76 in sigma notation.

1. Each term is a multiple of 19, so use 19k for the term rule.
2. 19k gives the first term when k = 1.
3. 19k gives the last term when k = 4.

Answer: $\Sigma_{k=1}^{4}$ 19k

PRACTICE 6 problems

1 Express 4 + 8 + 12 + 16 + 20 in sigma notation.

ANSWER _____

2 Express 1 + 4 + 7 + 10 + 13 in sigma notation.

ANSWER _____

3 Express 2 + 4 + 8 + 16 + 32 in sigma notation.

ANSWER _____

4 Express 1 + 4 + 9 + 16 + 25 in sigma notation.

ANSWER _____

5 Express 1/2 + 1/4 + 1/8 + 1/16 in sigma notation.

ANSWER _____

6 Express 6 + 4 + 2 + 0 + (-2) in sigma notation.

ANSWER _____

APPLY IT Show your work

1 You save $8 in week 1, $12 in week 2, $16 in week 3, $20 in week 4, and $24 in week 5 for concert tickets. Express the total saved in sigma notation. Do not evaluate.

WORK SPACE

ANSWER _____

2 A gaming app awards 5 points for your first daily login. The award doubles each day for a total of four days. Express the total points awarded in sigma notation. Do not evaluate.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Express 5 + 8 + 11 + ... + 32 in sigma notation. Explain how you found the upper limit.

WORK SPACE AND ANSWER

ANSWER KEY # Sum It Up

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Express 4 + 8 + 12 + 16 + 20 in sigma notation.	$\Sigma_{k=1}^{5}\ 4k$
2	Express 1 + 4 + 7 + 10 + 13 in sigma notation.	$\Sigma_{k=1}^{5}\ (3k - 2)$
3	Express 2 + 4 + 8 + 16 + 32 in sigma notation.	$\Sigma_{k=1}^{5}\ 2^k$
4	Express 1 + 4 + 9 + 16 + 25 in sigma notation.	$\Sigma_{k=1}^{5}\ k^2$
5	Express 1/2 + 1/4 + 1/8 + 1/16 in sigma notation.	$\Sigma_{k=1}^{4}\ 1/2^k$
6	Express 6 + 4 + 2 + 0 + (-2) in sigma notation.	$\Sigma_{k=0}^{4}\ (6 - 2k)$

PART 2 · APPLY IT

1. **$\Sigma_{k=1}^{5}\ (4k + 4)$ dollars** The amount saved rises by $4 each week. The rule 4k + 4 gives $8 at week 1 and $24 at week 5.
2. **$\Sigma_{k=0}^{3}\ 5 \cdot 2^k$ points** The four awards are 5, 10, 20, and 40 points. Starting at k = 0 makes $5 \cdot 2^k$ produce all four awards.

CHALLENGE

$\Sigma_{k=1}^{10}\ (3k + 2)$. The upper limit is 10 because 3(10) + 2 = 32.

Accept equivalent sigma expressions with different starting indices if they produce exactly the listed terms. For the challenge, the explanation must show why the chosen upper limit produces 32.