



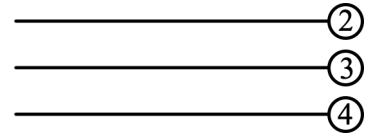
## APPLICATION ACTIVITY

**Instructions for Parents.** You should encourage your child to play with these questions for as long as they are able to make progress. However, please do not force them to finish every problem, and do not solve them yourself; all answers given below should be the sole work of the applicant. If your child has questions regarding the instructions below, or would like clarification on what sort of response to submit, please contact us at [camplemma@proofschool.org](mailto:camplemma@proofschool.org).

### *Sneaky Segments Instructions*

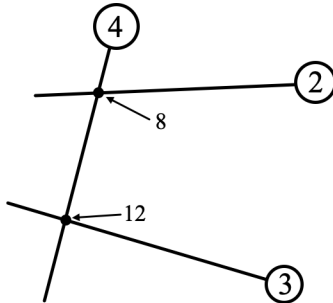
In each puzzle, the goal is to arrange a collection of segments, each of which have a certain value, into a configuration that comes as close to the target score as possible. Here's an example:

TARGET: 23

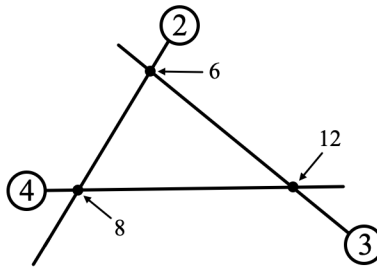


The value of a configuration depends on how the segments overlap. Here are three possibilities.

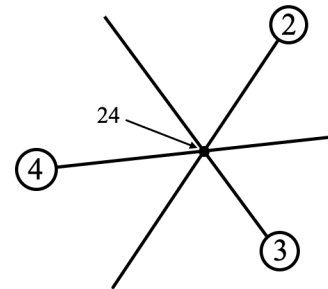
FIRST ANSWER



SECOND ANSWER



THIRD ANSWER



To find the value of a configuration,

- go to each point where segments cross (marked by black dots),
- *multiply* the numbers on all the segments passing through that point,
- then *add up those products* to compute the overall value.

Therefore the overall values of three configurations above are 20, 26, and 24, going from left to right, so the third answer is the best! (It's not possible to get exactly 23, in this case.)

## *Sneaky Segments Puzzles*

Puzzle #1

Three segments  
Numbers: 2, 3, 5  
Target: 21

Your diagram:

SCORE: \_\_\_\_\_

Puzzle #2

Three segments  
Numbers: 2, 4, 5  
Target: 37

Your diagram:

SCORE: \_\_\_\_\_

Puzzle #3

Four segments  
Numbers: 2, 2, 3, 4  
Target: 24

Your diagram:

SCORE: \_\_\_\_\_

Puzzle #4

Four segments  
Numbers: 2, 3, 4, 5  
Target: 55

Your diagram:

SCORE: \_\_\_\_\_

Puzzle #5

Four segments  
Numbers: 2, 4, 5, 6  
Target: 100

Your diagram:

SCORE: \_\_\_\_\_

Puzzle #6

Five segments  
Numbers: 1, 2, 3, 4, 5  
Target: 127

Your diagram:

SCORE: \_\_\_\_\_

## *Up And Back Down*

(a) To begin, compute the three sums shown here.

$1 + 2 + 1 = \underline{\hspace{2cm}}$

$1 + 2 + 3 + 2 + 1 = \underline{\hspace{2cm}}$

$1 + 2 + 3 + 4 + 3 + 2 + 1 = \underline{\hspace{2cm}}$

(b) Based on the pattern, write down the next addition problem (and answer) in the space below.

(c) What do you notice about the answers? Write one sentence to describe your observation.

(d) Use your pattern to predict this answer. (Don't actually add up all the numbers!)

$1 + 2 + 3 + \cdots + 199 + 200 + 199 + 198 + \cdots + 2 + 1 = \underline{\hspace{4cm}}$

(e) I wonder why this happens. If you have any ideas, present them in the space below.  
(It's fine to draw a diagram, if that's helpful.)