

# Nederlandse Wiskunde Olympiade voor Bedrijven



vrijdag 22 januari 2016

- Available time: 25 minutes.
- For this “uitsmijter” only an answer is required, no calculation or proof. A correct and complete answer is worth 10 points. For an answer that is not complete or not completely correct you may also get some points.
- Formula sheets and calculators are not allowed. You can only use a pen, compass, ruler or set square and of course your mental skills.
- Good luck!

For the contest managers: Score first round:          Score uitsmijter:

Name:

Company:

## Uitsmijter

Consider the set  $\{1, 22, 2016\}$ . We take two or more numbers from this set and add them together. In this example, we can do this in three different ways with two numbers ( $1 + 22 = 23$ ,  $1 + 2016 = 2017$  and  $22 + 2016 = 2038$ ), and in one more way with three numbers ( $1 + 22 + 2016 = 2039$ ). Observe that in this case the four outcomes are all distinct. However, if we consider a larger set of numbers and do the same (getting many more ways of adding two or more numbers) some of the outcomes might coincide.

In this problem we are looking for sets of five distinct positive integers, leading to the least possible number of outcomes when you add up two or more numbers in every possible way.

- Determine the least number of distinct outcomes for such a set (of five distinct positive integers).
- Give an example of such a set (of five distinct positive integers) leading to the least number of distinct outcomes.
- Determine all possible sets (of five distinct positive integers) leading to the least number of distinct outcomes and containing 2016 as one of its five numbers.

Answer:

a)

b)

c)