

# Nederlandse Wiskunde Olympiade voor Bedrijven



Friday, 25 January 2019

- Available time: 20 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:
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Name:

Company:

## Uitsmijter

By  $\gcd(a, b)$  we denote the largest (integer) number by which  $a$  and  $b$  are both divisible (with an integer result and no remainder). For example,  $\gcd(10, 12) = 2$ ,  $\gcd(30, 12) = 6$  and  $\gcd(11, 12) = 1$ . For  $\gcd(n, n + 2)$  the outcome depends on the value of  $n$ : if  $n$  is odd, there exists no integer larger than 1 by which both  $n$  and  $n + 2$  are divisible, but if  $n$  is even, then  $n$  and  $n + 2$  can both be divided by 2 (and no larger integer than 2). So the possible outcomes of  $\gcd(n, n + 2)$  are 1 and 2.

In the questions below  $n$  can vary over the positive integers.

- What are the possible outcomes of  $\gcd(12n + 2, 30)$ ?
- What are the possible outcomes of  $\gcd(3n + 4, 5n - 1)$ ?
- What are the possible outcomes of  $\gcd(n^2 + 4n + 3, n + 8)$ ?

Answer:

(a)

(b)

(c)