

Cryptologie

Uitwerkingen



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Blz 5

opgave

1 = A, 2 = B, enz.

9 11 8 15 15 16 4 1 20 10 5 22 5 5 12 16 12 5 26 9 5 18 8 5
I K H O O P D A T J E V E E L P L E Z I E R H E

2 20 2 9 10 8 5 20 23 5 18 11 5 14 1 1 14 3 18 25 16 20 15 12
B T B I J H E T W E R K E N A A N C R Y P T O L

15 7 9 5.
O G I E

Blz 7

opgave 1

32 15 45 45 15 43 44 53 35 43 14 15 34 13 24 25 21 15 43 44
L E T T E R S W O R D E N C I J F E R S

opgave 2

W A A R O N T M O E T I K J O U?
53 11 11 43 35 34 45 33 35 15 45 24 31 25 35 51

opgave 3

44 45 11 35 33 55 15 44 51 51 43 ~~53~~ 35 41 14 15 23 35 ~~51~~ 15 31 52
S T A O M Z E S U U R W O P D E H O V E K V

11 34 ~~41~~ 14 15 44 45 43 11 11 45.
A N ~~P~~ D E S T R A A T

Blz. 9

opgave 1

Schrijf het bericht zigzaggend over twee regels:

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | T | A | N | E | A | D | E | E | E | K | M | N |
| I | M | G | I | M | N | T | W | T | N | O | E | |

Schrijf dan eerst de letters van de bovenste regel op, en dan van de onderste regel:

D T A N E A D E E E K M N I M G I M N T W T N O E

Blz. 9 (vervolg)

opgave 2

Verdeel de code in twee gelijke delen: HTNC JEEI GLKA EOTI FRNS EUTX

Schrijf de eerste helft van de letters op met steeds een lege plek ertussen:

H T N C J E E I G L K A

Schrijf dan de tweede helft van de letters ertussen in.

H E T O N T C I J F E R E N I S G E L U K T A X

Aan het eind staan twee onzinletters.

opgave 3

Verdeel de code in twee gelijke delen:

DZKA TSIT ERED GU EE ARIN EMEG LIFW

Schrijf de eerste helft op met steeds een lege plek ertussen:

D Z K A T S I T E R E D G U

Schrijf dan de tweede helft van de letters ertussen in.

D E Z E K A A R T I S N I E T M E E R G E L D I G F U W

Aan het eind staan drie onzinletters.

Blz. 11

opgave 1

Schrijf het bericht in de tabel:

| | | | | | | |
|---|---|---|---|---|---|---|
| D | E | B | U | U | R | V |
| R | O | U | W | G | A | A |
| T | M | O | R | G | E | N |
| O | P | R | E | I | S | P |

Schrijf dan de letters van boven naar beneden op:

DRTO EOMP BUOR UWRE UGGI RAES VANP

opgave 2

In de opgave staat dat er een tabel met 7 rijen en 4 kolommen is gebruikt. Teken dus zo'n tabel.

Als je een bericht omzet naar code, is de laatste stap dat je de letters van boven naar beneden opschrijft.

Als je een code moet omzetten naar een bericht, moet je beginnen met de letters van boven naar beneden in de tabel zetten.

Als je dan van links naar rechts leest, lees je het bericht:

| | | | |
|---|---|---|---|
| D | E | L | A |
| D | D | E | R |
| S | T | A | A |
| T | T | E | G |
| E | N | H | E |
| T | H | U | I |
| S | A | B | C |

DE LADDER STAAT TEGEN HET HUIS (ABC)

Blz. 11 (vervolg)

opgave 3

Maak een tabel van 3 rijen en 8 kolommen.
Schrijf de code van boven naar beneden.
Van links naar rechts lees je dan het bericht:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| W | O | E | N | S | D | A | G |
| G | A | A | T | H | E | T | G |
| E | B | E | U | R | E | N | L |

WOENSDAG GAAT HET GEBEUREN (L)

opgave 4

De code bestaat uit 15 letters. Daar kun je een tabel van 3 rijen met 5 kolommen of een tabel van 5 rijen met 3 kolommen van maken. Als je beide mogelijkheden maakt en je schrijft de code er (van boven naar beneden) in dan krijg je de tabellen hiernaast. In de rechter tabel lees je van links naar rechts: ER IS GEEN SLEUTEL.

| | | |
|---|---|---|
| E | U | S |
| E | I | E |
| E | N | G |
| R | T | L |
| E | S | L |

| | | | | |
|---|---|---|---|---|
| E | R | I | S | G |
| E | E | N | S | L |
| E | U | T | E | L |

opgave 5

Er zijn 30 letters. Je kunt dus tabellen van 15x2, 10x3, 6x5, 5x6, 3x10 of 2x15 maken. Als je gaat uitproberen zul je ontdekken dat je de tabel van 3 rijen met 10 kolommen nodig hebt. Je leest dan het bericht:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| D | E | A | D | E | L | A | A | R | C |
| I | R | K | E | L | T | B | O | V | E |
| N | H | E | T | H | U | I | S | C | R |

DE ADELAAR CIRKELT BOVEN HET HUIS (CR)

Blz. 13

opgave 1

Schrijf het bericht in de tabel, onder het sleutelwoord hond, van links naar rechts.
Verwissel dan de kolommen zodanig dat de letters van het sleutelwoord op alfabetische volgorde komen te staan.
Schrijf dan de code over uit de tabel, schrijf van boven naar beneden. Je krijgt dan de code:
OTSA LDME GCCU IHTE PREK

| | | | |
|---|---|---|---|
| h | o | n | d |
| D | E | C | O |
| M | P | U | T |
| E | R | I | S |
| G | E | H | A |
| C | K | T | L |

→

| | | | |
|---|---|---|---|
| d | h | n | o |
| O | D | C | E |
| T | M | U | P |
| S | E | I | R |
| A | G | H | E |
| L | C | T | K |

Blz. 13 (vervolg)

opgave 2

Maak een tabel met bovenin de letters van het sleutelwoord 'kundig' op alfabetische volgorde.

Schrijf de code in die tabel, van boven naar beneden.

Verwissel de kolommen zodanig dat bovenin het woord 'kundig' ontstaat.

Je leest nu het bericht van links naar rechts: ONDER DE VIJFDE STOEPTEGEL (B)

| | | | | | |
|---|---|---|---|---|---|
| d | g | i | k | n | u |
| E | D | R | O | D | N |
| J | D | F | E | I | V |
| O | P | E | E | T | S |
| E | B | L | T | G | E |

→

| | | | | | |
|---|---|---|---|---|---|
| k | u | n | d | i | g |
| O | N | D | E | R | D |
| E | V | I | J | F | D |
| E | S | T | O | E | P |
| T | E | G | E | L | B |

opgave 3

Maak een tabel met bovenin de letters van het sleutelwoord 'stoep' op alfabetische volgorde.

Schrijf de code in die tabel, van boven naar beneden.

Verwissel de kolommen zodanig dat bovenin het woord 'stoep' ontstaat.

Je leest nu het bericht van links naar rechts: DE TREIN HEEFT EEN UUR VERTRAGING (VS)

| | | | | |
|---|---|---|---|---|
| e | o | p | s | t |
| R | T | E | D | E |
| E | H | E | I | N |
| E | E | N | F | T |
| V | R | E | U | U |
| A | R | G | R | T |
| V | G | S | I | N |

→

| | | | | |
|---|---|---|---|---|
| s | t | o | e | p |
| D | E | T | R | E |
| I | N | H | E | E |
| F | T | E | E | N |
| U | U | R | V | E |
| R | T | R | A | G |
| I | N | G | V | S |

opgave 4

Met drie letters kun je in totaal 6 verschillende manieren hebben om de kolommen te ordenen. In de derde tabel van links hieronder krijg je een leesbaar bericht dat zegt: NEEM DE RECHTER LIFT (V)

| | | |
|---|---|---|
| 1 | 2 | 3 |
| E | N | E |
| D | M | E |
| E | R | C |
| T | H | E |
| L | R | I |
| T | F | V |

| | | |
|---|---|---|
| 1 | 3 | 2 |
| E | E | N |
| D | E | M |
| E | C | R |
| T | E | H |
| L | I | R |
| T | V | F |

| | | |
|---|---|---|
| 2 | 1 | 3 |
| N | E | E |
| M | D | E |
| R | E | C |
| H | T | E |
| R | L | I |
| F | T | V |

| | | |
|---|---|---|
| 2 | 3 | 1 |
| N | E | E |
| M | E | D |
| R | C | E |
| H | E | T |
| R | I | L |
| F | V | T |

| | | |
|---|---|---|
| 3 | 1 | 2 |
| E | E | N |
| E | D | M |
| C | E | R |
| E | T | H |
| I | L | R |
| V | T | F |

| | | |
|---|---|---|
| 3 | 2 | 1 |
| E | N | E |
| E | M | D |
| C | R | E |
| E | H | T |
| I | R | L |
| V | F | T |

opgave 5

Als je de letters van het woord 'acht' op alfabetische volgorde zet krijg je weer 'acht'. De kolommen veranderen dus niet van plaats.

Blz. 13 (vervolg)

opgave 6

Omdat er twee dezelfde letters in het woord 'twee' zitten, is niet duidelijk welke kolom als eerste en welke als tweede genomen moet worden.

Blz. 15

opgave 1

Elke letter verschuift 5 plaatsen, dus de A wordt de F, de B wordt de G, enz.

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALFABET | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| verschuiving +5 | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BERICHT | K | I | J | K | U | I | T | N | A | A | R | E | E | N | G | R | O | E | N | E | A | U | T | O |
| verschuiving +5 | P | N | O | P | Z | N | Y | S | F | F | W | J | J | S | L | W | T | J | S | J | F | Z | Y | T |

De code wordt: PNOP ZNYS FFWJ JSLW TJSJ FZYT

opgave 2

De volgende tabel is gebruikt voor het vercijferen:

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALFABET | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| verschuiving +4 | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |

Voor het ontcijferen zoek je telkens de letter op de onderste rij en kijk je welke letter erboven staat.

| | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CODE | Q | S | V | K | I | R | M | W | I | V | A | I | I | V | I | I | R | H | E | K |
| verschuiving -4 | M | O | R | G | E | N | I | S | M | R | W | E | E | R | E | E | N | D | A | G |

opgave 3

In plaats van '-24' kun je ook '+2' doen. Probeer maar eens. Het bericht wordt dan: GEEF MIJ MAAR SLAGROOMTAART.

Blz. 15 (vervolg)

opgave 4

| | | | | | | | | | | | |
|----|---|---|---|---|---|---|---|---|--|--|--|
| | C | E | Q | C | F | A | L | U | | | |
| +1 | D | F | R | D | G | | | | | | |
| +2 | E | G | S | E | H | | | | | | |
| +3 | F | H | T | F | I | | | | | | |
| +4 | G | I | U | G | J | | | | | | |
| +5 | H | J | V | H | K | | | | | | |
| +6 | I | K | W | I | L | | | | | | |
| +7 | J | L | X | J | M | | | | | | |
| +8 | K | M | Y | K | N | | | | | | |
| +9 | L | N | Z | L | O | | | | | | |

Onder de C is verder 'geteld' naar D, E, F, G, enz.

Onder de E is verder 'geteld' naar F, G, H, I, enz.

Onder de Q verder met R, S, T, U, enz.

Nadat er een aantal letters een stukje verder geschreven zijn zie je op de rij van '+6' de woorden 'IK WIL' ontstaan.

Dat zal dus waarschijnlijk de verschuiving zijn die je nodig hebt. Als je de rest van de codeletters ook +6 doet krijg je:

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | Q | C | F | A | L | U | U | A | Y | Y | H | E | I | J | D | Y | E | I | Z | Z | C | Y |
| I | K | W | I | L | G | R | A | A | G | E | E | N | K | O | P | J | E | K | O | F | F | I | E |

opgave 5

Omdat je de code moest omzetten naar het bericht door +6 te doen, wat hetzelfde is als -20 (probeer maar uit), is het bericht versleuteld met C^{20} .

Blz. 17

opgave 1

De tabel hieronder hoort bij het sleutelwoord 'vliegvakantie'.

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BERICHTLETTERS | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| CODELETTERS | V | L | I | E | G | A | K | N | T | U | W | X | Y | Z | B | C | D | F | H | J | M | O | P | Q | R | S |

Zoek de letters van de code in de onderste rij en kijk welke berichtletter erbij hoort.

Je krijgt dan :

| | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CODE | E | G | J | T | U | E | O | X | T | G | K | J | O | B | B | F | L | T | U | Q |
| BERICHT | D | E | T | I | J | D | V | L | I | E | G | T | V | O | O | R | B | I | J | D |

opgave 2

De tabel hieronder hoort bij het sleutelwoord 'schoolboeken'.

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BERICHTLETTERS | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| CODELETTERS | S | C | H | O | L | B | E | K | N | P | Q | R | T | U | V | W | X | Y | Z | A | D | F | G | I | J | M |

De versleuteling gaat als volgt:

| | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BERICHT | H | E | T | A | L | A | R | M | S | T | A | A | T | U | I | T |
| CODE | K | L | A | S | R | S | Y | T | Z | A | S | S | A | D | N | A |

Blz. 17 (vervolg)

opgave 3

De tabel hieronder hoort bij het sleutelwoord 'bureaustoel'.

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BERICHTLETTERS | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| CODELETTERS | B | U | R | E | A | S | T | O | L | M | N | P | Q | V | W | X | Y | Z | C | D | F | G | H | I | J | K |

De versleuteling gaat als volgt:

| | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CODE | M | B | V | H | A | A | D | E | A | R | W | E | A | L | K | W |
| BERICHT | J | A | N | W | E | E | T | D | E | C | O | D | E | I | Z | O |

opgave 4

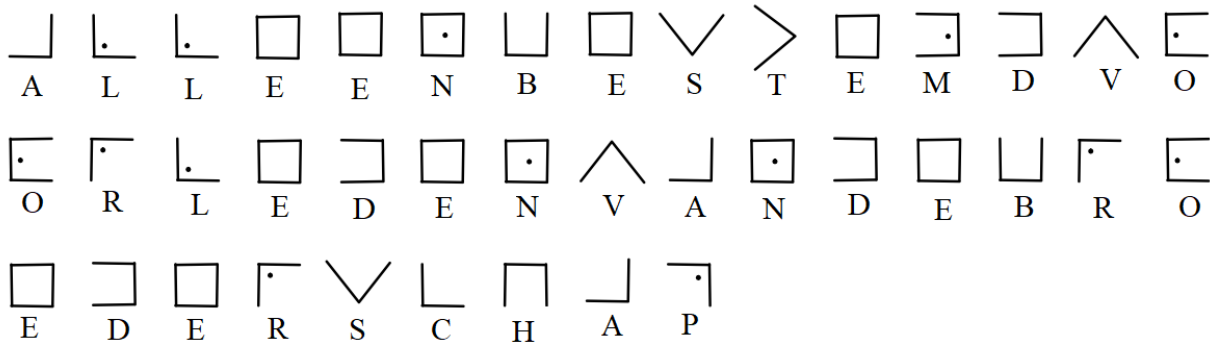
Je zou de versleutelingstabel hieronder krijgen.

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BERICHTLETTERS | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| CODELETTERS | Z | A | N | D | E | F | G | H | I | J | K | L | M | O | P | Q | R | S | T | U | V | W | X | Y | B | C |

Dan zouden 10 letters door zichzelf vervangen worden.

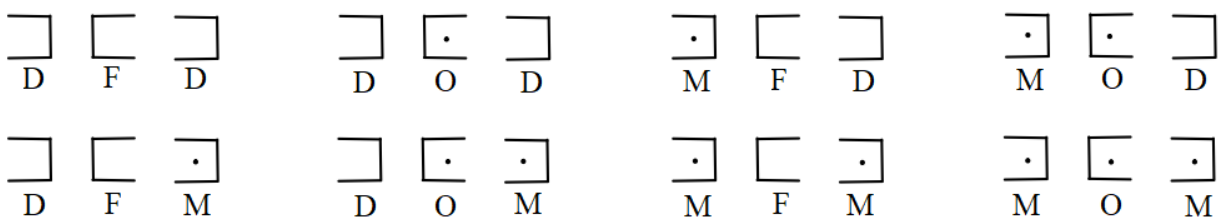
Blz. 19

opgave 1



opgave 2

Er zijn acht verschillende mogelijkheden:



Alleen het woord 'DOM' is een echt woord, dus dat zal het wachtwoord zijn.

Blz. 19 (vervolg)

opgave 3

Er zijn dus vier posities (letters), en op elke positie zijn er twee mogelijkheden: met punt of zonder punt. Ik noteer 'met punt' als een '+' en 'zonder punt' als een '-'. Er zijn dan de volgende 16 mogelijkheden:

| | | | |
|---------|---------|---------|---------|
| + + + + | + - + + | - + + + | - - + + |
| + + + - | + - + - | - + + - | - - + - |
| + + - + | + - - + | - + - + | - - - + |
| + + - - | + - - - | - + - - | - - - - |

Met de tekens \lrcorner \sphericalangle \triangleright \ulcorner zijn de volgende 16 mogelijkheden:

| | | | | | | | | | | | | | | | |
|-------------|-------------------|------------------|-------------|-------------|-------------------|------------------|-------------|-------------|-------------------|------------------|-------------|-------------|-------------------|------------------|-------------|
| \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner |
| \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner |
| \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner |
| \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner | \lrcorner | \sphericalangle | \triangleright | \ulcorner |

Blz. 21

opgave 1

Het bericht is: IN DE FREQUENTIETABEL KUN JE GEMAKKELIJK ZIEN HOE VAAK DE LETTERS A EN N IN DE NEDERLANDSE TAAL GEBRUIKT WORDEN.

opgave 2

Het bericht is: DE WANDELAAR HEEFT DE BERICHTEN VAN DE COMMANDANT KUNNEN ONTCIJFEREN OMDAT HIJ DE SLEUTEL VAN DE CODE WIST.

opgave 3

Omdat je dan te weinig letters hebt om een goede frequentietabel te maken.

opgave 4

Er komt geen enkele letter E in voor.

Blz. 23

opgave 1

De W moet 15 plaatsen verschuiven en wordt een L.

W X Y Z A B C D E F G H I J K L
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

De E moet 5 plaatsen verschuiven en wordt een J.

E F G H I J
 1 2 3 4 5

Blz. 25

opgave 2

De E op de rij van de t (verschuiving 20) geeft een Y.

| | | Letters van het bericht | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | |
| Rijen met de letters en nummer van het sleutelwoord | 1 | a | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| | 2 | b | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| | 3 | c | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| | 4 | d | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| | 5 | e | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| | 6 | f | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| | 7 | g | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| | 8 | h | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| | 9 | i | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| | 10 | j | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| | 11 | k | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| | 12 | l | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| | 13 | m | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| | 14 | n | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| | 15 | o | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| | 16 | p | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| | 17 | q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| | 18 | r | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| | 19 | s | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| | 20 | t | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| | 21 | u | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| | 22 | v | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| | 23 | w | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| | 24 | x | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| | 25 | y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
| | 26 | z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

De D op de rij van de v (verschuiving 22) geeft een Z.

| | | Letters van het bericht | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | |
| Rijen met de letters en nummer van het sleutelwoord | 1 | a | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| | 2 | b | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| | 3 | c | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| | 4 | d | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| | 5 | e | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| | 6 | f | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| | 7 | g | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| | 8 | h | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| | 9 | i | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| | 10 | j | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| | 11 | k | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| | 12 | l | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| | 13 | m | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| | 14 | n | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| | 15 | o | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| | 16 | p | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| | 17 | q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| | 18 | r | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| | 19 | s | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| | 20 | t | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| | 21 | u | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| | 22 | v | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| | 23 | w | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| | 24 | x | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| | 25 | y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
| | 26 | z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

De E op de rij van de o (verschuiving 15) geeft een T.

| | | Letters van het bericht | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | |
| Rijen met de letters en nummer van het sleutelwoord | 1 | a | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| | 2 | b | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| | 3 | c | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| | 4 | d | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| | 5 | e | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| | 6 | f | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| | 7 | g | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| | 8 | h | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| | 9 | i | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| | 10 | j | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| | 11 | k | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| | 12 | l | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| | 13 | m | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| | 14 | n | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| | 15 | o | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| | 16 | p | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| | 17 | q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| | 18 | r | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| | 19 | s | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| | 20 | t | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| | 21 | u | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| | 22 | v | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| | 23 | w | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| | 24 | x | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| | 25 | y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
| | 26 | z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

De drie letters E worden achtereenvolgens vervangen door een J, een Y en een T. Dat komt doordat er de éne keer een verschuiving van 5 is, de volgende keer een verschuiving van 20 en de laatste keer een verschuiving van 15.

Blz. 25 (vervolg)

opgave 3

De codeletter Z moet je zoeken op rij nummer 22. Bovenaan staat dan berichtletter D.

| | | Letters van het bericht | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | |
| Rijen met de letters en nummer van het sleutelwoord | 1 | a | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| | 2 | b | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| | 3 | c | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| | 4 | d | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| | 5 | e | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| | 6 | f | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| | 7 | g | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| | 8 | h | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| | 9 | i | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| | 10 | j | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| | 11 | k | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| | 12 | l | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| | 13 | m | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| | 14 | n | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| | 15 | o | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| | 16 | p | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| | 17 | q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| | 18 | r | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| | 19 | s | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| | 20 | t | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| | 21 | u | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| | 22 | v | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| | 23 | w | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| | 24 | x | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| | 25 | y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
| | 26 | z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

De codeletter J moet je zoeken op rij nummer 1. Bovenaan staat dan berichtletter I.

| | | Letters van het bericht | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | |
| Rijen met de letters en nummer van het sleutelwoord | 1 | a | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| | 2 | b | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| | 3 | c | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| | 4 | d | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| | 5 | e | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| | 6 | f | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| | 7 | g | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| | 8 | h | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| | 9 | i | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| | 10 | j | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| | 11 | k | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| | 12 | l | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| | 13 | m | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| | 14 | n | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| | 15 | o | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| | 16 | p | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| | 17 | q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| | 18 | r | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| | 19 | s | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| | 20 | t | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| | 21 | u | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| | 22 | v | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| | 23 | w | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| | 24 | x | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| | 25 | y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
| | 26 | z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

De codeletter Z moet je zoeken op rij nummer 12. Bovenaan staat dan berichtletter N.

| | | Letters van het bericht | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | |
| Rijen met de letters en nummer van het sleutelwoord | 1 | a | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| | 2 | b | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| | 3 | c | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| | 4 | d | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| | 5 | e | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| | 6 | f | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| | 7 | g | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| | 8 | h | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| | 9 | i | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| | 10 | j | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| | 11 | k | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| | 12 | l | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| | 13 | m | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| | 14 | n | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| | 15 | o | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| | 16 | p | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| | 17 | q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| | 18 | r | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| | 19 | s | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| | 20 | t | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| | 21 | u | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| | 22 | v | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| | 23 | w | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| | 24 | x | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| | 25 | y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
| | 26 | z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

De codeletter O moet je zoeken op rij nummer 22. Bovenaan staat dan berichtletter S.

| | | Letters van het bericht | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | |
| Rijen met de letters en nummer van het sleutelwoord | 1 | a | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| | 2 | b | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| | 3 | c | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| | 4 | d | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| | 5 | e | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| | 6 | f | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| | 7 | g | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| | 8 | h | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| | 9 | i | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| | 10 | j | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| | 11 | k | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| | 12 | l | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| | 13 | m | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| | 14 | n | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| | 15 | o | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| | 16 | p | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| | 17 | q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| | 18 | r | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| | 19 | s | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| | 20 | t | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| | 21 | u | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| | 22 | v | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| | 23 | w | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| | 24 | x | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| | 25 | y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
| | 26 | z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

De codeletter E moet je zoeken op rij nummer 1. Bovenaan staat dan berichtletter D.

| | | Letters van het bericht | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | |
| Rijen met de letters en nummer van het sleutelwoord | 1 | a | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| | 2 | b | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| | 3 | c | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| | 4 | d | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| | 5 | e | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| | 6 | f | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| | 7 | g | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| | 8 | h | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| | 9 | i | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| | 10 | j | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| | 11 | k | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| | 12 | l | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| | 13 | m | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| | 14 | n | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| | 15 | o | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| | 16 | p | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| | 17 | q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| | 18 | r | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| | 19 | s | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| | 20 | t | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| | 21 | u | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| | 22 | v | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| | 23 | w | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| | 24 | x | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| | 25 | y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
| | 26 | z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

De codeletter M moet je zoeken op rij nummer 12. Bovenaan staat dan berichtletter A.

| | | Letters van het bericht | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | |
| Rijen met de letters en nummer van het sleutelwoord | 1 | a | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| | 2 | b | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| | 3 | c | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| | 4 | d | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| | 5 | e | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| | 6 | f | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| | 7 | g | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| | 8 | h | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| | 9 | i | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| | 10 | j | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| | 11 | k | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| | 12 | l | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| | 13 | m | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| | 14 | n | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| | 15 | o | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| | 16 | p | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| | 17 | q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| | 18 | r | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| | 19 | s | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| | 20 | t | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| | 21 | u | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| | 22 | v | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| | 23 | w | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| | 24 | x | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| | 25 | y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
| | 26 | z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

De codeletter C moet je zoeken op rij nummer 22. Bovenaan staat dan berichtletter G.

| | | Letters van het bericht | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | |
| Rijen met de letters en nummer van het sleutelwoord | 1 | a | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| | 2 | b | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| | 3 | c | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| | 4 | d | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| | 5 | e | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| | 6 | f | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| | 7 | g | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| | 8 | h | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| | 9 | i | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| | 10 | j | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| | 11 | k | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| | 12 | l | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| | 13 | m | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| | 14 | n | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| | 15 | o | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| | 16 | p | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| | 17 | q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| | 18 | r | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| | 19 | s | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| | 20 | t | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| | 21 | u | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| | 22 | v | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| | 23 | w | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| | 24 | x | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| | 25 | y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
| | 26 | z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

Het bericht is: DINSDAG

| | | | | | | | |
|--------------|----|---|----|----|---|----|----|
| bericht | D | I | N | S | D | A | G |
| sleutelwoord | v | a | l | v | a | l | v |
| verplaatsing | 22 | 1 | 12 | 22 | 1 | 12 | 22 |
| code | Z | J | Z | O | E | M | C |

Blz. 27

opgave 1

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|---|----|----|---|---|---|----|----|---|----|---|---|----|---|---|----|---|---|---|----|---|----|----|----|----|---|----|
| bericht | G | E | B | R | U | I | K | H | E | T | B | E | R | I | C | H | T | A | L | S | S | L | E | U | T | E | L |
| sleutel | b | o | s | g | e | b | r | u | i | k | h | e | t | b | e | r | i | c | h | t | a | l | s | s | l | e | u |
| verplaatsing | 2 | 15 | 19 | 7 | 5 | 2 | 18 | 21 | 9 | 11 | 8 | 5 | 20 | 2 | 5 | 18 | 9 | 3 | 8 | 20 | 1 | 12 | 19 | 19 | 12 | 5 | 21 |
| code | I | T | U | Y | Z | K | C | C | N | E | J | J | L | K | H | Z | C | D | T | M | T | X | X | N | F | J | G |

opgave 2

| | | | | | | | | | | | | | | |
|--------------|----|---|---|---|----|----|---|----|----|---|----|----|---|---|
| bericht | W | I | N | K | E | L | W | A | G | E | N | T | J | E |
| sleutel | j | a | c | h | t | w | i | n | k | e | l | w | a | g |
| verplaatsing | 10 | 1 | 3 | 8 | 20 | 23 | 9 | 14 | 11 | 5 | 12 | 23 | 1 | 7 |
| code | G | J | Q | S | Y | I | F | O | R | J | Z | Q | K | L |

Blz. 27 (vervolg)

opgave 3

| | | | | | | | | | | | | | | | | | | | | |
|--------------|---|----|----|----|----|----|---|---|----|---|---|----|---|----|---|---|---|----|----|---|
| bericht | O | N | D | E | R | D | E | V | I | J | F | D | E | S | T | E | E | N | X | G |
| sleutel | a | u | t | o | o | n | d | e | r | d | e | v | i | j | f | d | e | s | t | e |
| verplaatsing | 1 | 21 | 20 | 15 | 15 | 14 | 4 | 5 | 18 | 4 | 5 | 22 | 9 | 10 | 6 | 4 | 5 | 19 | 20 | 5 |
| code | P | I | X | T | G | R | I | A | A | N | K | Z | N | C | Z | I | J | G | R | L |

Blz. 29

opgave 1

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| e | g | n | r | t | u | | u | r | g | e | n | t |
| A | V | V | X | A | X | ⇒ | X | X | V | A | V | A |
| A | A | F | A | F | A | | A | A | A | A | F | F |
| D | D | D | F | G | F | | F | F | D | D | D | G |
| A | V | G | D | X | F | | F | D | V | A | G | X |

Tusseloplossing: XX VA VA AA AA FF FF DD DG FD VA GX

Bericht: V O O R R A A D I S O P

opgave 2

Als je in de code een letter A ziet staan, betekent dat alleen maar dat er een letter uit de rij of kolom van de A is gebruikt. Dat kan dus de A, D, F, G, V en X de letters R, K, X, 8, O, 5, G, 7, M, C of 3 zijn. Dan gaat frequentie-analyse niet werken.

opgave 3

In een sleutelwoord mogen de letters niet al vanzelf op alfabetische volgorde staan omdat de kolommen anders niet door elkaar gegooid worden. En er mogen geen dubbele letters in voorkomen omdat je anders niet weet welke kolom het eerste komt.

Blz. 31

opgave 1

1 is geen priemgetal want het heeft maar één deler.

2 is het kleinste priemgetal want het heeft twee delers: 1 en 2.

Het is ook het enige priemgetal dat 'even' is.

Blz. 31 (vervolg)

opgave 2

Priemgetallen die kleiner dan 100 zijn:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97.

opgave 3

$$13 \times 131 = 1703$$

$$17 \times 149 = 2533$$

$$41 \times 251 = 10291$$

opgave 4

$$377 = 13 \times 29$$

$$1403 = 23 \times 61$$

$$1829 = 31 \times 59$$

