









Schoolsupport

www.schoolsupport.nl

EID Premiums Relatiegeschenken bit. www.idpremiums.nl



www.mathplay.eu



calculators are not allowed



only a pencil, an eraser and scribbling paper are allowed

answers will be posted

on the website about

March 29th



you may use 75 minutes



results and prizes will arrive at school at the end of May



solutions will be posted on the website about April 20th







wizBRAIN havo 1, 2 & 3 vwo 1 & 2 vmbo 3 & 4 m.u.v. basisberoepsgerichte leerweg.

www.museumboerhaave.nl

**1.** Sanne looks at her weather app and sees that it will get colder each day for the next five days.

What can Sanne see on her weather app?



| 10. | A combination<br>Each of the fou   | lock has four whee<br>Ir wheels has been  | ls numbered with th<br>rotated 180 degree  | ne digits from 0 to 9,<br>es from the correct c                                    | in the correct o<br>ode.                           | rder.                               |  |  |
|-----|--|---|--|--|--|-------------------------------------|--|--|
|     | What is the co   | rrect code for the co   | ombination lock?   | 63   | <b>3480 (</b> )180°                                | 8 8 8 9 9<br>9 9 9 9 9<br>9 9 9 9 9 |  |  |
|     | 9704<br>0815<br>1926   | <b>B.</b> 2014  | C.   | 37811<br>4892<br>5003  | <b>E.</b> 9547                                     |                                     |  |  |
| 11. | <i>Berend</i> is 5 cm<br><i>Damin</i> is 10 cm   | n taller than <i>Aaron</i> , l<br>n taller than <i>Camiel</i>                                       | out 10 cm shorter tl<br>, but 5 cm shorter t   | nan <i>Camiel.</i><br>han <i>Erin.</i>   |  |                                     |  |  |
|     | Which of the following statements is true?   |   |  |  |  |                                     |  |  |
|     | <b>A.</b> <i>Aaron</i> and <i>I</i><br><b>C.</b> <i>Aaron</i> is 10<br><b>E.</b> <i>Aaron</i> is 30                      | Erin have equal hei<br>cm shorter than Er<br>cm shorter than Er                                     | ghts.<br>in.<br>in.  | <b>B.</b> <i>Aaron</i> is 10<br><b>D.</b> <i>Aaron</i> is 30                       | cm taller than <i>E</i><br>cm taller than <i>E</i> | Erin.<br>Erin.                      |  |  |
| 12. | <i>Fatima</i> wants t<br>Each digit can<br>Also, each nun<br>areas of 2 by 2   | o write one of the d<br>only appear once ir<br>nber may only appe<br>squares.                       | igits 1, 2, 3 and 4 ir<br>n each row and in e<br>ear once in each of                     | n each box in the pu<br>each column.<br>the four thickly outlin                    | zzle (Sudoku).<br>ned                              | 4     2     3       1     4       3 |  |  |
|     | In how many w  | /ays can <i>Fatima</i> fini   | sh this Sudoku?  |  |  |                                     |  |  |
|     | <b>A.</b> 1  | <b>B.</b> 2   | <b>C.</b> 3  | <b>D.</b> 4  | <b>E.</b> This is n                                | ot possible.                        |  |  |
| 13. | A rectangular p<br><i>Matt</i> breaks off<br>12 squares he<br>from the same  | biece of chocolate is<br>f two complete strip<br>obtains. Later, <i>Inge</i><br>bar in width and ea | s made of equal squ<br>s of squares length<br>breaks off one cor<br>ats all 9 squares sh | uares.<br>wise and eats all<br>nplete strip of squar<br>e obtains.                 | es   | width                               |  |  |
|     | How many squares of chocolate are left in the bar after this?  |   |  |  |  |                                     |  |  |
|     | <b>A.</b> 36   | <b>B.</b> 45  | <b>C.</b> 54   | <b>D.</b> 63   | <b>E.</b> 72                                       |                                     |  |  |
| 14. | A bottle filled o<br>The same bott   | ne fifth with water v<br>le filled four fifths w  | veighs 560 g.<br>ith water weighs 74   | 0 g.   |  |                                     |  |  |
|     | What is the weight of the empty bottle?  |   |  |  |  |                                     |  |  |
|     | <b>A.</b> 60 g   | <b>B.</b> 112 g   | <b>C.</b> 180 g  | <b>D.</b> 300 g  | <b>E.</b> 500 g                                    |                                     |  |  |
| 15. | The area of the large square is 16 cm <sup>2</sup> and the area of each of the four small squares is 1 cm <sup>2</sup> . |   |  |  |  |                                     |  |  |
|     | What is the total area of the black flower?  |   |  |  |  |                                     |  |  |
|     | <b>A.</b> 3 cm <sup>2</sup>  | <b>B.</b> 3.5 cm <sup>2</sup>   | <b>C.</b> 4 cm <sup>2</sup>  | <b>D.</b> 5.5 cm <sup>2</sup>  | <b>E.</b> 6 cm <sup>2</sup>                        |                                     |  |  |
| 16. | <i>Michiel</i> is build<br>He arranges th<br>The total lengtl  | ing a new fence in l<br>nese planks so that<br>h of <i>Michiel</i> 's new fe                        | his garden. He use<br>there is the same s<br>ence is 6.9 metres.                         | s 25 planks, each 30<br>light overlap betwee                                       | ) cm long.<br>en any two adjac                     | cent planks.                        |  |  |
|     | What is the length of the overlap between any pair of adjacent planks?   |   |  |  |  |                                     |  |  |
|     | <b>A.</b> 2.4 cm   | <b>B.</b> 2.5 cm  | <b>C.</b> 3 cm   | <b>D.</b> 4.8 cm   | <b>E.</b> 5 cm                                     |                                     |  |  |
| 17. | Five identical r<br>angles touch ir<br>It is also possil<br>that their small   | ight-angled triangle<br>the center. In this<br>ole to form a differe<br>er acute angles tou         | s can be arranged<br>way a star is forme<br>nt star by arranging<br>ch each other in th  | so that their larger a<br>d as shown in the di<br>more of these trian<br>e center. | cute<br>agram.<br>gles so                          | A                                   |  |  |
|     | How many tria  | How many triangles are needed to form this second star?   |  |  |  |                                     |  |  |
|     |  |   |  |  |  | -                                   |  |  |

| 18. | Five squares a<br>The smallest s  | are positioned as s<br>square has area 1.   | shown in the diagra  | am.  |  |
|-----|---|---|--|--|--|
|     | What is the va  | alue of <i>h</i> ?  |  |  |  |
|     | <b>A.</b> 3   | <b>B.</b> 3.5   | <b>C.</b> 4  | <b>D.</b> 4.2  | <b>E.</b> 4.5  |
| 19. | There are 20<br>Each correct a<br>blank scores (<br><i>Eric</i> took part   | questions in a quiz<br>answer scores 7 po<br>) points.<br>in this quiz and sco  | pints, each wrong a<br>ored 100 points.  | answer scores minu   | s 4 points and each question left  |
|     | How many qu   | estions did <i>Eric</i> lea   | ave blank?   |  |  |
|     | <b>A.</b> 0   | <b>B.</b> 1   | <b>C.</b> 2  | <b>D.</b> 3  | <b>E.</b> 4  |
| 20. | A rectangular<br>Two rectange   | strip of paper of di<br>Is are formed with  | mensions 4 by 13<br>areas <i>P</i> and <i>Q</i> , wh   | (diagram 1) is folded<br>here the area of <i>P</i> is  | d as shown in diagram 2.<br>twice the area of $Q$ .<br>Q<br>P<br>x                                       |
|     | What is the va  | alue of x?  |  | diagram 1  | diagram 2  |
|     | <b>A.</b> 5   | <b>B.</b> 5.5   | <b>C.</b> 6  | <b>D.</b> 6.5  | <b>E.</b> 4√2  |
| 21. | A box of fruit of<br>Alana and Imi<br>Which one of<br>A. Alana got a<br>C. Alana got a<br>E. Alana got a  | contains twice as n<br>re divided them up<br>the following state<br>at least one pear<br>twice as many app<br>as many pears as <i>l</i>       | nany apples as per<br>so that <i>Alana</i> got<br>ments is always tru<br>les as <i>Imre</i> .<br><i>Imre</i> got apples.     | ars.<br>twice as many piece<br>ue?<br><b>B.</b> <i>Alana</i> got<br><b>D.</b> <i>Alana</i> got | s of fruit as <i>Imre</i> .<br>twice as many apples as pears.<br>as many apples as <i>Imre</i> got pears |
| 22. | Three places From <i>Laagein</i> direct road.<br>From <i>Laagein</i> direct road.<br>From <i>Laagein</i> direct road.<br>From <i>Hogedo</i> direct road.<br>How long is the | are connected by r<br>od to <i>Hogedorp</i> the<br>od to <i>Middelstad</i> the<br><i>rp</i> to <i>Middelstad</i> the<br>ne shortest of the th | roads as shown.<br>detour via <i>Middel</i><br>e detour via <i>Hoged</i><br>le detour via <i>Laag</i><br>nree direct roads b | stad is 1 km longer t<br>dorp is 5 km longer t<br>eind is 7 km longer t<br>etween the places?  | han the<br>han the<br>han the<br>Laageind  |
|     | <b>A.</b> 1 km  | <b>B.</b> 2 km  | <b>C.</b> 3 km   | <b>D.</b> 4 km   | <b>E.</b> 5 km   |
| 23. | In a particular<br>The numerato<br>By what perce  | fraction, the nume<br>or of this fraction is<br>entage should its d   | erator and denomir<br>increased by 40%<br>enominator be deo  | nator are both positiv<br>creased so that the r  | e.<br>new fraction is double the original  |
|     | <b>A</b> 100/   | <b>B</b> 200/   | <b>C</b> 200/  | <b>D</b> 100/  | <b>5</b> 0%  |
|     | A. 10%  |   |  | <b>U.</b> 40%  |  |
| 24. | The six-digit n   | umber 1ABCDE is   | multiplied by 3 ar   | ia the result is ABCE  | i⊢1, also a six-digit number.  |
|     | What is the su  | im of the six digits  | ot this number?  |  |  |
|     | <b>A.</b> 24  | <b>B.</b> 27  | <b>C.</b> 30   | <b>D.</b> 33   | <b>E.</b> 36   |

| 25.               | A soccer ball is made of white hexagons and black pentagons, as seen in the picture.<br>There are a total of 12 pentagons.   |   |   |  |  |   |  |
|-------------------|--|---|---|--|--|---|--|
|                   | How many hexa  | igons are there?  | )   |  |  | Y |  |
|                   | <b>A.</b> 12   | <b>B.</b> 15  | <b>C.</b> 18  | <b>D.</b> 20   | <b>E.</b> 24   |   |  |
| 26.               | A triangular pyramid is built with 20 balls, as shown.<br>Each ball is labelled with one of the letters <i>A</i> , <i>B</i> , <i>C</i> , <i>D</i> or <i>E</i> .<br>There are four balls with each type of label.<br>The picture shows the labels of the balls on three of the faces of the pyramid.  |   |   |  |  |   |  |
|                   | D<br>CA<br>BED<br>DECA   | D<br>BC<br>EAB<br>CBA   |   |  |  |   |  |
|                   | What is the labe   | el on the hidden  | ball in the center  | of the pyramid's   | base?  |   |  |
|                   | <b>A.</b> A  | <b>B.</b> <i>B</i>  | <b>C.</b> <i>C</i>  | <b>D.</b> <i>D</i>   | <b>E.</b> <i>E</i>   |   |  |
| 27.               | <ul> <li>In a tournament, each of the six teams plays one match against every other team.<br/>In each round of matches, three take place simultaneously.<br/>A TV station has already decided which match it will broadcast in each round, as shown in the diagr<br/>below.</li> </ul>   |   |   |  |  |   |  |
|                   | Round 1  | Round 2   | Round 3   | Round 4  | Round 5  |   |  |
|                   | A - B  | C-D   | A - E   | E - F  | A - C  |   |  |
|                   |  |   | 1   |  |  |   |  |
|                   | In which round v   | <b>I</b><br>will team <i>D</i> play   | I<br>against team <i>F</i> ?  |  | I  |   |  |
|                   | In which round v   | l<br>will team <i>D</i> play<br><b>B.</b> 2   | against team <i>F</i> ?<br><b>C.</b> 3  | <b>D.</b> 4  | <b>E.</b> 5  |   |  |
| 28.               | In which round w<br><b>A.</b> 1<br>2021 coloured k<br>Each kangaroo<br>Amongst any th<br><i>Lucas</i> guesses<br>These are his gr<br>kangaroo 1002   | I<br>will team <i>D</i> play<br><b>B.</b> 2<br>cangaroos are ar<br>is coloured eithe<br>ree consecutive<br>the colours of fiv<br>uesses: Kangaro<br>is blue; kangaro  | against team <i>F</i> ?<br><b>C.</b> 3<br>rranged in a row a<br>er red, grey or blu<br>kangaroos, there<br>ve kangaroos.<br>too 2 is grey; kang<br>o 2021 is grey. O  | <b>D.</b> 4<br>and are number<br>ie.<br>e are always kar<br>garoo 20 is blue;<br>nly one of his gu   | <b>E.</b> 5<br>ed from 1 to 2021.<br>garoos of all three colours.<br>kangaroo 202 is red;<br>uesses is wrong.  |   |  |
| 28.               | In which round w<br><b>A.</b> 1<br>2021 coloured k<br>Each kangaroo<br>Amongst any the<br><i>Lucas</i> guesses<br>These are his gr<br>kangaroo 1002<br>What is the num   | I<br>will team <i>D</i> play<br><b>B.</b> 2<br>angaroos are ar<br>is coloured eithe<br>ree consecutive<br>the colours of fiv<br>uesses: Kangaro<br>is blue; kangaro   | against team <i>F</i> ?<br><b>C.</b> 3<br>rranged in a row a<br>er red, grey or blu<br>kangaroos, there<br>ve kangaroos.<br>too 2 is grey; kang<br>o 2021 is grey. O<br>aroo whose colou  | <b>D.</b> 4<br>and are number<br>le.<br>e are always kar<br>garoo 20 is blue;<br>nly one of his gu   | E. 5<br>ed from 1 to 2021.<br>agaroos of all three colours.<br>kangaroo 202 is red;<br>uesses is wrong.<br>d incorrectly?  |   |  |
| 28.               | In which round w<br><b>A.</b> 1<br>2021 coloured k<br>Each kangaroo<br>Amongst any th<br><i>Lucas</i> guesses<br>These are his gu<br>kangaroo 1002<br>What is the num<br><b>A.</b> 2   | I<br>will team <i>D</i> play<br><b>B.</b> 2<br>angaroos are ar<br>is coloured eithe<br>ree consecutive<br>the colours of fiv<br>uesses: Kangaro<br>is blue; kangaro<br>nber of the kanga  | against team <i>F</i> ?<br><b>C.</b> 3<br>rranged in a row a<br>er red, grey or blu<br>kangaroos, there<br>ve kangaroos.<br>too 2 is grey; kang<br>o 2021 is grey. O<br>aroo whose colou<br><b>C.</b> 202   | <b>D.</b> 4<br>and are number<br>le.<br>e are always kar<br>garoo 20 is blue;<br>only one of his gu<br>ur <i>Lucas</i> guesse<br><b>D.</b> 100   | E. 5<br>ed from 1 to 2021.<br>Igaroos of all three colours.<br>kangaroo 202 is red;<br>uesses is wrong.<br>d incorrectly?<br>2 E. 2021   |   |  |
| 28.               | In which round w<br><b>A.</b> 1<br>2021 coloured k<br>Each kangaroo<br>Amongst any th<br><i>Lucas</i> guesses<br>These are his gu<br>kangaroo 1002<br>What is the num<br><b>A.</b> 2<br>In a town there a<br>The stadtholder<br>Every person in<br>As a result, 200  | I<br>will team <i>D</i> play<br><b>B.</b> 2<br>angaroos are ar<br>is coloured either<br>ree consecutive<br>the colours of fivuesses: Kangaro<br>is blue; kangaro<br>ber of the kangaro<br>ber of the kangaro<br><b>B.</b> 20<br>are 21 knights w<br>divided 2020 of<br>a pair described<br>0 people were c  | against team <i>F</i> ?<br><b>C.</b> 3<br>rranged in a row a<br>er red, grey or blu<br>kangaroos, there<br>ve kangaroos.<br>to 2 is grey; kang<br>o 2021 is grey. O<br>aroo whose colou<br><b>C.</b> 202<br>who always tell the<br>these 2021 peop<br>d the other person<br>alled knights and   | <b>D.</b> 4<br>and are number<br>le.<br>e are always kar<br>garoo 20 is blue;<br>only one of his gu<br>ur <i>Lucas</i> guesse<br><b>D.</b> 100<br>e truth and 2000<br>ole into 1010 pai<br>n as either a kni<br>20 people were   | E. 5<br>ed from 1 to 2021.<br>garoos of all three colours.<br>kangaroo 202 is red;<br>uesses is wrong.<br>d incorrectly?<br>2 E. 2021<br>villains who always lie.<br>rs.<br>ght or a villain.<br>called villains.  |   |  |
| 28.               | In which round we are a constrained with the second | <ul> <li>I will team <i>D</i> play</li> <li>B. 2</li> <li>B. 2</li> <li>angaroos are an is coloured eitheree consecutive the colours of fivuesses: Kangaro</li> <li>aber of the kanga</li> <li>B. 20</li> <li>are 21 knights wildided 2020 of a pair describer</li> <li>0 people were cos of two villains wildides willians willian</li></ul> | against team <i>F</i> ?<br><b>C.</b> 3<br>rranged in a row a<br>er red, grey or blu<br>kangaroos, there<br>ve kangaroos.<br>too 2 is grey; kang<br>o 2021 is grey. O<br>aroo whose colou<br><b>C.</b> 202<br>who always tell the<br>these 2021 peop<br>d the other person<br>called knights and<br>were there?  | <b>D.</b> 4<br>and are number<br>le.<br>e are always kar<br>garoo 20 is blue;<br>only one of his gu<br>ur <i>Lucas</i> guesse<br><b>D.</b> 100<br>e truth and 2000<br>ole into 1010 pai<br>n as either a kni<br>l 20 people were   | E. 5<br>ed from 1 to 2021.<br>agaroos of all three colours.<br>kangaroo 202 is red;<br>uesses is wrong.<br>d incorrectly?<br>2 E. 2021<br>villains who always lie.<br>rs.<br>ght or a villain.<br>called villains.   |   |  |
| 28.               | In which round we are a constrained with the second | I<br>will team <i>D</i> play<br><b>B.</b> 2<br>angaroos are an<br>is coloured eithe<br>ree consecutive<br>the colours of fivuesses: Kangaro<br>is blue; kangaro<br>aber of the kanga<br><b>B.</b> 20<br>are 21 knights w<br>divided 2020 of<br>a pair described<br>0 people were c<br>s of two villains v<br><b>B.</b> 985  | against team <i>F</i> ?<br><b>C.</b> 3<br>rranged in a row a<br>er red, grey or blu<br>kangaroos, there<br>ve kangaroos.<br>to 2 is grey; kang<br>o 2021 is grey. O<br>aroo whose colou<br><b>C.</b> 202<br>who always tell the<br>these 2021 peop<br>d the other person<br>called knights and<br>were there?<br><b>C.</b> 990  | <b>D.</b> 4<br>and are number<br>le.<br>e are always kar<br>garoo 20 is blue;<br>only one of his gu<br>ur <i>Lucas</i> guesse<br><b>D.</b> 100<br>e truth and 2000<br>ole into 1010 pai<br>n as either a kni<br>l 20 people were<br><b>D.</b> 995  | E. 5<br>ed from 1 to 2021.<br>agaroos of all three colours.<br>kangaroo 202 is red;<br>aesses is wrong.<br>d incorrectly?<br>2 E. 2021<br>villains who always lie.<br>rs.<br>ght or a villain.<br>called villains.   |   |  |
| 28.<br>29.<br>30. | In which round we are a second | <ul> <li>I will team <i>D</i> play</li> <li>B. 2</li> <li>angaroos are ar is coloured eitheree consecutive the colours of fivuesses: Kangaro</li> <li>aber of the kangaro</li> <li>ber of the kangaro</li> <li>aber of the kangaro</li> <li>aber of the kangaro</li> <li>aber of the kangaro</li> <li>ber of the kangaro</li> <li>ber of the kangaro</li> <li>aber of the kangaro</li> <li>ber of the large qualith a common version of the large qualithered areas of the ar</li></ul> | against team <i>F</i> ?<br><b>C.</b> 3<br>rranged in a row a<br>er red, grey or blu<br>kangaroos, there<br>/e kangaroos.<br>to 2 is grey; kang<br>o 2021 is grey. O<br>aroo whose colou<br><b>C.</b> 202<br>/ho always tell the<br>these 2021 peop<br>d the other person<br>alled knights and<br>were there?<br><b>C.</b> 990<br>drilateral divided<br>ertex <i>K</i> . The othe<br>of the correspond | D. 4<br>and are number<br>le.<br>e are always kar<br>garoo 20 is blue;<br>only one of his gu<br>ur <i>Lucas</i> guesse<br>D. 100<br>e truth and 2000<br>ble into 1010 pai<br>n as either a kni<br>20 people were<br>D. 995<br>into four smaller<br>r labelled points<br>ee equal parts.<br>ling small quadr                      | E. 5<br>ed from 1 to 2021.<br>Igaroos of all three colours.<br>kangaroo 202 is red;<br>uesses is wrong.<br>d incorrectly?<br>2 E. 2021<br>villains who always lie.<br>rs.<br>ph or a villain.<br>called villains.<br>E. 1000<br>$V_{V_{V}} = \frac{V_{V} + V_{V}}{V_{V}} + \frac{V_{V} + V_{V}}{V} + $   |   |  |
| 28.<br>29.<br>30. | In which round we are a second with the second seco | I<br>will team <i>D</i> play<br><b>B.</b> 2<br>angaroos are an<br>is coloured either<br>ree consecutive<br>the colours of fivuesses: Kangaro<br>aber of the kangaro<br>aber of the kangaro<br>ber of the kangaro<br><b>B.</b> 20<br>are 21 knights w<br>divided 2020 of<br>a pair described<br>0 people were c<br>s of two villains v<br><b>B.</b> 985<br>ows a large qua<br>ith a common ve<br>of the large qua<br>icate the areas of<br>a of the grey qua   | C. 3<br>rranged in a row a<br>er red, grey or blu<br>kangaroos, there<br>/e kangaroos.<br>to 2 is grey; kang<br>o 2021 is grey. O<br>aroo whose colou<br>C. 202<br>/ho always tell the<br>these 2021 peop<br>d the other person<br>alled knights and<br>were there?<br>C. 990<br>drilateral divided<br>ertex <i>K</i> . The othe<br>adrilateral?  | <b>D.</b> 4<br>and are number<br>le.<br>e are always kar<br>garoo 20 is blue;<br>only one of his gu<br>ur <i>Lucas</i> guesse<br><b>D.</b> 100<br>e truth and 2000<br>ole into 1010 pai<br>n as either a kni<br>20 people were<br><b>D.</b> 995<br>into four smaller<br>r labelled points<br>ee equal parts.<br>ling small quadr | E. 5<br>ed from 1 to 2021.<br>agaroos of all three colours.<br>kangaroo 202 is red;<br>aesses is wrong.<br>d incorrectly?<br>2 E. 2021<br>villains who always lie.<br>rs.<br>ght or a villain.<br>called villains.<br>E. 1000<br>$V = \frac{V_{0}}{V_{0}} = V$ |   |  |