Mathematics Challenge

GRADE 6 FIRST ROUND
SEPTEMBER 2007

NOTE:

- Answer the questions according to the instructions on the answer sheet.
- You may use a calculator.
- The questions test insight. Complex calculations will therefore not be necessary.
- We hope you enjoy it!

Wiskunde-uitdaging

GRAAD 6 EERSTE RONDE
SEPTEMBER 2007

LET OP:

- Beantwoord die vrae volgens die instruksies op die antwoordblad.
- Jy mag 'n sakrekenaar gebruik.
- Die vrae toets insig. Omslagtige berekeninge is dus onnodig en tydrowend.
- Ons hoop jy geniet dit!

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1. The figure is formed by successively joining the midpoints of the sides of a square. What fraction of the whole figure is shaded?

1. Die figuur is gevorm deur die middelpunte van opeenvolgende vierkante te verbind. Watter breukdeel van die hele figuur is verdonker?

(A) $\frac{1}{3}$ (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) $\frac{2}{9}$ (E) $\frac{3}{8}$

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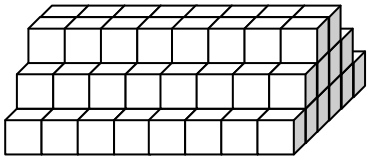
2. How many small blocks are in this solid pile?

2. Hoeveel klein blokkies is in hierdie soliede stapel?



(A) 96 (B) 24 (C) 41 (D) 32 (E) 1004

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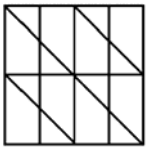
3. How many triangles are there in this figure?

3. Hoeveel driehoeke is daar in hierdie figuur?



(A) 12 (B) 14 (C) 16 (D) 18 (E) 20

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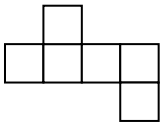
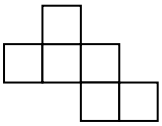
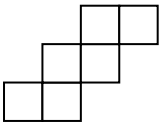
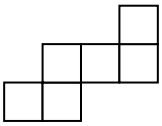
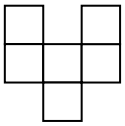
4. Which one of the following figures below *cannot* be folded along the lines to form a cube?

4. Watter een van die volgende figure kan *nie* gevou word om ’n kubus te vorm nie?

(A) 
(B) 
(C) 
(D) 
(E) 

AMESA The Association for Mathematics Education of South Africa

In cooperation with the
Western Cape Education Department
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Nasou Via Afrika

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Research Unit for Mathematics Education of the University of Stellenbosch

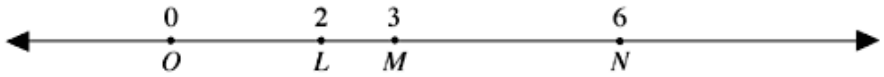
5. Which fraction is exactly halfway between $\frac{1}{5}$ and $\frac{1}{7}$?

(A) $\frac{1}{6}$ (B) $\frac{1}{35}$ (C) $\frac{1}{12}$

5. Watter breuk is presies halfpad tussen $\frac{1}{5}$ en $\frac{1}{7}$?

(D) 0,6 (E) Not one of these / Nie een hiervan nie

6. Point *P* (not shown) on the number line is 5 units from point *N* and 2 units from point *M*. Where is point P located?



(A) Between *O* and *L*
(B) Between *L* and *M*
(C) Between *M* and *N*
(D) To the right of *N*
(E) On *L*

6. Punt *P* (nie aangedui nie) op die getallelyn is 5 eenhede vanaf punt *N* en 2 eenhede vanaf punt *M*. Waar is punt P geleë?

(A) Tussen *O* en *L*
(B) Tussen *L* en *M*
(C) Tussen *M* en *N*
(D) Regs van *N*
(E) Op *L*

7. From a batch of 3000 light bulbs, 100 were selected at random and tested. Five of the bulbs in the sample were found to be defective. About how many defective light bulbs would be expected in the entire batch?

(A) 15 (B) 60 (C) 150 (D) 300 (E) 600

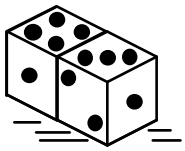
7. Uit ’n besending van 3000 gloeilampe is 100 willekeurig geselekteer en getoets. Vyf van die gloeilampe in die monster was defektief. Omtrent hoeveel defektiewe gloeilampe kan mens in die hele besending verwag?

8. The numbers in the pattern 2, 7, 12, 17, 22, … increase by five. The numbers in the pattern 3, 10, 17, 24, 31… increase by seven. The number 17 occurs in both patterns. If the two patterns are continued, what is the next number that will be seen in both patterns?

(A) 17 (B) 27 (C) 38 (D) 42 (E) 52

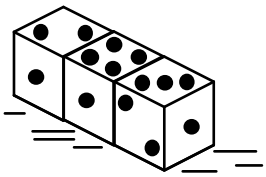
8. Die getalle in die patroon 2, 7, 12, 17, 22, … neem toe met vyf. Die getalle in die patroon 3, 10, 17, 24, 31, … neem toe met sewe. Die getal 17 kom in albei patrone voor. As die twee patrone voortgesit word, wat sal die volgende getal wees wat in albei patrone voorkom?

9. If we place dice side by side in a row on a table, only some of the faces are visible: With 2 dice in the row 8 faces are visible; with 3 dice in the row 11 faces are visible, etc. If 75 dice are placed in a row, how many faces will be visible?



(A) 227 (B) 175 (C) 225

9. As ons dobbelstene op ’n tafel in ’n ry teen mekaar pak, is net sommige sye (vlakke) sigbaar: Met 2 dobblestene in die ry is 8 sye sigbaar; met 3 in die ry is 11 sye sigbaar, ens. Hoeveel sye sal sigbaar wees as 75 dobbelstene so in ’n ry gepak word?



(D) 300 (E) 275

10. Bruce was born on a Tuesday in January 1995. When is the first year when his birthday will again fall on a Tuesday?

(A) 2000 (B) 2001 (C) 2002 (D) 2003 (E) Not one of these / Nie een hiervan nie

10. Bruce is op ’n Dinsdag in Januarie 1995 gebore. Wanneer is die eerste jaar dat sy verjaardag weer op ’n Dinsdag sal val?

11. You have three 10c coins, two 5c coins and two 20c coins. In how many different ways can you give a person 35c?

(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

11. Jy het drie 10c muntstukke, twee 5c muntstukke en twee 20c muntstukke. Op hoeveel verskillende maniere kan jy ’n persoon 35c gee?

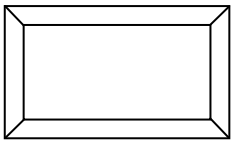
12. A factory makes business cards measuring 90 mm by 50 mm by cutting it from A4-sized cardboard sheets (210 mm by 297 mm). What is the maximum number of cards that can be cut from one sheet?

(A) 13,86 (B) 14 (C) 10 (D) 12 (E) 13

12. 'n Fabriek maak visitekaartjies van 90 mm by 50 mm deur dit uit A4-grootte kartonvelle (210 mm by 297 mm groot) te sny. Wat is die maksimum aantal kaartjies wat uit een vel gesny kan word?

13. You have a piece of wood 480 mm long from which you want to make a rectangular picture frame like in the sketch, with one side twice as long as the other. What length should you cut the longer side?

13. Jy het 'n stuk hout wat 480 mm lank is, waaruit jy 'n reghoekige fotoraam soos in die skets maak, met een sy twee keer so lank as die ander. Hoe lank moet jy die langste sy maak?



(A) 180 mm (B) 160 mm (C) 80 mm (D) 120 mm (E) 320 mm

14. Each of the nine small squares in the diagram are to be filled so that each row and each column contains exactly one 1, one 2 and one 3. What must M + N be?

14. Elkeen van die nege klein vierkante in die diagram moet gevul word, sodat elke ry en elke kolom presies een 1, een 2 en een 3 bevat. Wat sal M + N wees?

		M
	2	**N**
1		

(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

15. In question 14, what is the sum of all nine numbers in the diagram?

(A) 9 (B) 12 (C) 15 (D) 18 (E) 16

15. In vraag 14, wat is die som van al nege getalle in die diagram?

16. In a chess competition players get 1 point for winning a game, $\frac{1}{2}$ a point for drawing and no pints for losing. Molly played 7 games in a tournament and only lost one game. Her final score was 5 points. How many games did she win?

(A) 5 (B) 4 (C) 3 (D) 2 (E) 1

16. In 'n skaakkompetisie kry spelers 1 punt as hulle 'n wedstryd wen, $\frac{1}{2}$ punt as hulle gelykop speel en geen punte as hulle verloor nie. Molly het 7 wedstryde gespeel en slegs een verloor. Haar finale telling was 5 punte. Hoeveel wedstryde het sy gewen?

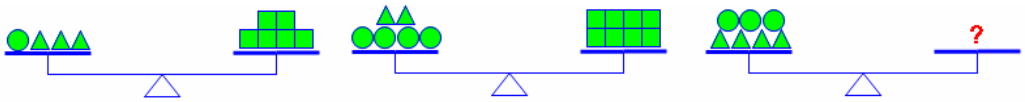
17. The sum of two numbers is 18. What is the greatest possible product of the two numbers?

(A) 36 (B) 81 (C) 80 (D) 100 (E) 18

17. Die som van twee getalle is 18. Wat is die grootste moontlike produk van die twee getalle?

18. The first two scales below are perfectly balanced. How many squares are needed in place of **?** so that the third scale will balance?

18. Die eerste twee skale hieronder is perfek gebalanseer. Hoeveel vierkante moet in die plek van die **?** wees sodat die derde skaal balanseer?



(A) 8 (B) 9 (C) 12 (D) 14 (E) 10

19. In a certain month on a calendar, the sum of the dates in one full week (Sunday to Saturday) is 126. What is the date on Friday?

(A) 18 (B) 23 (C) 22 (D) 20 (E) 21

19. In ’n sekere maand op ’n kalender is die som van die datums van een volle week (Sondag tot Saterdag) 126. Wat is die datum op die Vrydag?

20. The numbers 4, 5, 6 are called consecutive numbers. If the sum of 9 consecutive numbers is 135, what is the smallest of these numbers?

(A) 12 (B) 13 (C) 14 (D) 15 (E) Not one of these / Nie een hiervan nie

20. Die getalle 4, 5, 6 word opeenvolgende getalle genoem. As die som van 9 opeenvolgende getalle 135 is, wat is die kleinste van hierdie getalle??

21. Ali, Eli, Oli and Uli are all different ages. They are 5, 6, 7 and 8 years old, not necessarily in this order.
Oli’s age is an even number
Uli is not the youngest
Uli and Eli’s ages are both odd numbers

How old is Eli?

(A) 5 (B) 6 (C) 7 (D) 8 (E) Not enough information / Nie genoeg inligting nie

21. Ali, Eli, Oli en Uli is almal verskillende ouderdomme, nl. 5, 6, 7 en 8, nie noodwendig in hierdie volgorde nie.
Oli se ouderdom is ’n ewe getal
Uli is nie die jongste nie
Uli en Eli se ouderdomme is beide onewe getalle

Hoe oud is Eli?

22. Refer to the previous question. How old is Ali?

(A) 5 (B) 6 (C) 7 (D) 8 (E) Not enough information / Nie genoeg inligting nie

22. Verwys na die vorige vraag. Hoe oud is Ali?

23. The number pattern below is called Pascal’s Triangle. The sum of the numbers in *Row 2* is 1 + 2 + 1 = 4. What is the sum of the numbers in *Row 8?*

23. Die getalpatroon hieronder word Pascal se Driehoek genoem. Die som van die getalle in *Ry 2* is 1 + 2 + 1 = 4. Wat is die som van die getalle in *Ry 8?*

1 ← ***Row 0***
1 1 ← ***Row 1***
1 2 1 ← ***Row 2***
1 3 3 1 ← ***Row 3***
1 4 6 4 1 ← ***Row 4***
1 5 10 10 5 1
1 6 15 20 15 6 1

(A) 512 (B) 64 (C) 256 (D) 128 (E) Not one of these / Nie een hiervan nie

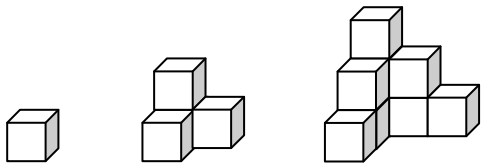
24. One piece of bubble gum and one small chocolate cost 90c. Ten pieces of bubble gum and five small chocolates cost R4,70. How much does one small chocolate cost?

(A) 78c (B) 4c (C) 76c (D) 86c (E) 82c

24. Een stuk kougom en een klein sjokolade kos saam 90c. Tien stukke kougom en vyf klein sjokolades kos R4,70. Hoeveel kos een klein sjokolade?

25. Thandi builds a pattern of cubes as shown. How many cubes will there be in *Pattern 20?*

25. Thandi bou patrone met kubusse soos getoon. Hoeveel kubusse sal in *Patroon 20* wees?



Pattern 1 *Pattern 2* *Pattern 3*

(A) 312 (B) 400 (C) 412 (D) 441 (E) 40