Mathematics Challenge 2009
GRADE 6 FIRST ROUND

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 2009
GRAAD 6 EERSTE RONDE

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!

---

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

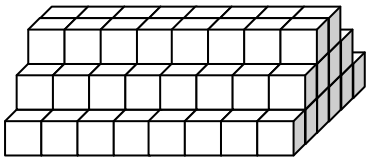
1. Die figuur is gevorm deur die middelpunte van opeenvolgende vierkante te verbind. Watter breudeel van die hele figuur is verdonker?

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

---

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

---

3. In the magic square below the sum of the three numbers in each row, column and diagonal is 18. What number comes in block A?

3. In die towervierkant hieronder is die som van die drie getalle in elke ry, kolom en diagonaal gelyk aan 18. Watter getal moet in blok A kom?

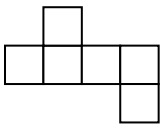
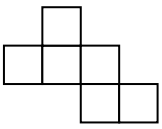
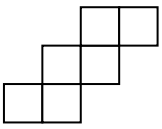
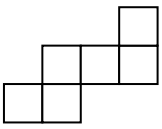
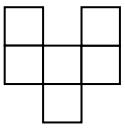
		A
11	**6**	
		10

(A) 1 (B) 3 (C) 5 (D) 7 (E) 9

---

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
Gauteng Education Department

Nasou Via Afrika

CASIO

RUMEUS
Research Unit for Mathematics Education of the University of Stellenbosch

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

(A) $\frac{1}{6}$ (B) $\frac{2}{12}$ (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. The symbol ◊ represents a number. What value of ◊ makes this sentence true?

$$\frac{\lozenge}{2} = \frac{32}{\lozenge}$$

(A) 4 (B) 64 (C) 8

6. Die simbool ◊ stel ’n getal voor. Watter waarde van ◊ maak hierdie getalsin waar?

$$\frac{\lozenge}{2} = \frac{32}{\lozenge}$$

(D) 17 (E) 16

7. If you begin with a one-digit number, multiply it by 3, then add 8, then divide by 2 and then subtract 6, you will get the original number back. What is the number?

(A) 2 (B) 8 (C) 6

7. As jy begin met ’n eensyfergetal, dit vermening-vuldig met 3, dan 8 bytel, dan deel deur 2 en dan 6 aftrek, sal jy die oorspronklike getal kry. Wat is die getal?

(D) 5 (E) 4

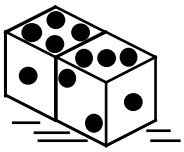
8. The numbers in the pattern 2, 7, 12, 17, 22, … increase by five. The numbers in the pattern 3, 10, 17, 24, 31… increase by seven. The number 17 occurs in both patterns. If the two patterns are continued, what is the next number that will be seen in both patterns?

(A) 17 (B) 27 (C) 38

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?

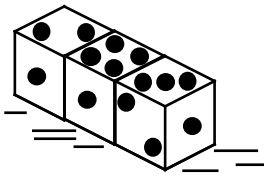
(D) 42 (E) 52

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) 75 (B) 227 (C) 225

9. As ons dobbelstene op ’n tafel in ’n ry teen mekaar pak, is net sommige sye is 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. A wooden cube, 2 cm long on each side, has a mass of 100 grams. Another cube of the same wood is 6 cm long on each side. What is its mass?

(A) 1 000 g (B) 2 700 g (C) 800 g

10. ’n Houtkubus, 2 cm lank aan elke kant, het ’n massa van 100 gram. ’n Ander kubus van dieselfde hout is 6 cm lank aan elke kant. Wat is sy massa?

(D) 900 g (E) 300 g

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

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

(D) 4 (E) 5

12. 102 marbles are divided among 7 boys. How many more marbles are still needed so that each boy will receive the same number of marbles and there are none left over?

(A) 1 (B) 2 (C) 3

12. 102 albasters word tussen 7 seuns verdeel. Hoeveel albasters is nog nodig sodat elke seun dieselfde getal albasters sal hê en daar niks sal oorbly nie?

(D) 4 (E) 5

13. The letter A is rotated 180° about O. What will the position of A be now?

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

13. Die letter A word deur 180° om O geroteer. Wat is die posisie van A nou?

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 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 square?

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

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

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?

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?

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

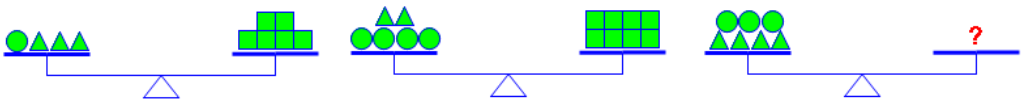
17. The sum of two numbers is 18. What is the greatest possible product of the two numbers?

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

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

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

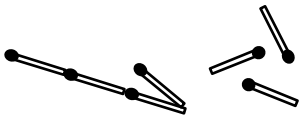
18. Die eerste twee skale hieronder is perfek gebalenseer. Hoeveel vierkante moet in die plek van die ? wees sodat die derde skaal balenseer?



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

19. How many different triangles can you build with 7 whole matches? Note: the order of the sides does not matter, e.g. the triangles with sides 3, 3, 1 and 3, 1, 3 are the same.

19. Hoeveel verskillende driehoeke kan jy met 7 heel vuurhoutjies bou? Let op dat die volgorde van die sye nie saak maak nie, bv. die driehoeke met sye 3, 3, 1 en 3, 1, 3 is dieselfde.



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

20. The sum of seven one-digit positive whole numbers is 17. If six of these numbers are equal, what is the other number?

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

20. Die som van sewe eensyfer positiewe heelgetalle is 17. As ses van die getalle gelyk is, wat is die sewende getal?

21. I am thinking of a 3-digit number which:
When it is divided by 3 the remainder is 1
When it is divided by 4 the remainder is 2
When it is divided by 5 the remainder is 3
When it is divided by 9 the remainder is 7

What number am I thinking of?

(A) 58 (B) 118 (C) 598 (D) 133 (E) 178

21. Ek dink aan ’n 3-syfer getal wat:
As dit deur 3 gedeel word is die res 1
As dit deur 4 gedeel word is die res 2
As dit deur 5 gedeel word is die res 3
As dit deur 9 gedeel word is die res 7

Aan watter getal dink ek?

22. If a glass is full of milk, the total mass is 370 g. When the glass is half full of milk, the mass is 290 g. What is the mass of the glass?

(A) 80 g (B) 100 g (C) 160 g (D) 180 g (E) 210 g

22. Wanneer ’n glas vol melk is, is die totale massa 370 g. Wanneer die glas halfvol melk is, is die massa 290 g. Wat is die massa van die glas?

23. The number pattern below is called Pascal’s Triangle. Which number is missing?

23. Die getalpatroon hieronder word Pascal se Driehoek genoem. Watter getal ontbreek?

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 ? 15 6 1

(A) 28 (B) 20 (C) 30 (D) 19 (E) 22

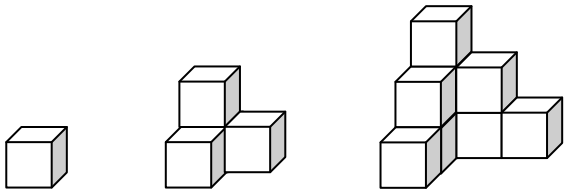
24. One piece of bubble gum and one small chocolate cost R0,90. Ten pieces of bubble gum and five small chocolates cost R4,70. How much does one small chocolate cost?

(A) R0,96 (B) R0,04 (C) R0,90 (D) R0,86 (E) R3,80

24. Een stuk kougom en een klein sjokolade kos saam R0,90. 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