Mathematics Challenge

GRADE 7 FIRST ROUND
AUGUST 2010

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 7 EERSTE RONDE
AUGUSTUS 2010

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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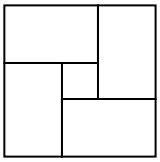
1. Four rectangles and a square are arranged as shown. Each of the four rectangles is 5 cm long and 3 cm wide. What is the area of the square at the centre?

1. Vier reghoeke en ’n vierkant word gerangskik soos getoon. Elkeen van die vier reghoeke is 5 cm lank en 3 cm breed. Wat is die oppervlakte van die vierkant in die middel?



(A) 1 cm^2 (B) 4 cm^2 (C) 8 cm^2 (D) 9 cm^2 (E) 16 cm^2

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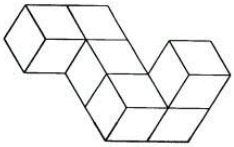
2. What is the surface (outside) area of this solid figure if the cubes each measure 1 cm on each side?

2. Wat is die buite-oppervlakte van hierdie soliede figuur as die kubusse elk 'n sylengte van 1 cm het?



(A) 26 cm^2 (B) 28 cm^2 (C) 29 cm^2 (D) 30 cm^2 (E) None of these / Nie een hiervan nie

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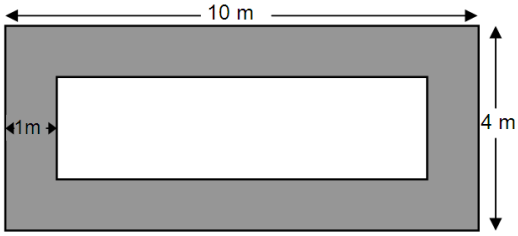
3. A path, one metre wide, surrounds a rectangular garden as shown in the figure below. What is the area of the garden (the white part)?

3. ’n Paadjie, een meter wyd, omring ’n reghoekige tuin soos in die skets getoon. Wat is die oppervlakte van die tuin (die wit gedeelte)?



(A) 16 m^2 (B) 40 m^2 (C) 36 m^2 (D) 32 m^2 (E) 24 m^2

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4. In question 3: What is the area of the path?

4. In vraag 3: Wat is die oppervlakte van die paadjie?

(A) 28 m^2 (B) 30 m^2 (C) 20m^2 (D) 32 m^2 (E) 24 m^2

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

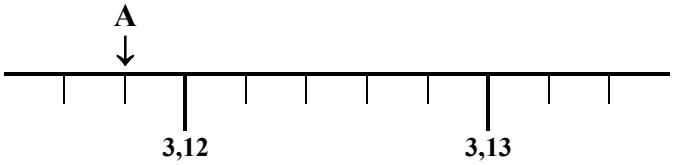
5. In a competition the first four judges gave Dori scores of 4,5; 4,6; 4,7 and 5,0. What score did the fifth judge give her if her average score from the five judges was 4,8?

(A) 4,8 (B) 4,9 (C) 5,0 (D) 5,1 (E) 5,2

5. In ’n kompetisie het die eerste vier beoordelaars vir Dori tellings gegee van 4,5; 4,6; 4,7 en 5,0. Watter telling het die vyfde beoordelaar haar gegee as haar gemiddelde telling van die vyf beoordelaars 4,8 was?

6. What is the number indicated by A on the ruler?

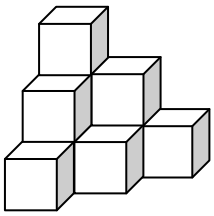
6. Wat is die getal aangedui deur A op die liniaal?



(A) 3,11 (B) 3,1 (C) 3,118 (D) 3,15 (E) 3,18

7. The sketch shows cubes stacked on a table. Each cube is 1 cm by 1 cm by 1 cm. How many cubes are in this stack?

7. Die skets hieronder toon kubusse wat op ’n tafel gepak is. Elke kubus is 1 cm by 1 cm by 1 cm. Hoeveel kubusse is daar in die stapel?



(A) 6 (B) 7 (C) 8 (D) 9 (E) 10

8. In question 7: What area of the table do these cubes cover?

(A) 6 cm^2 (B) 7 cm^2 (C) 8 cm^2 (D) 9 cm^2 (E) 10 cm^2

8. In vraag 7: Watter oppervlakte van die tafel word deur die kubusse gedek?

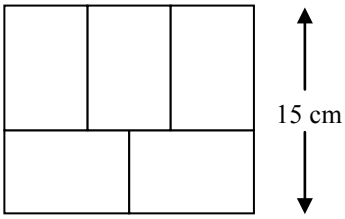
9. In the Soccer World Cup group stage, every team plays one game against every other team in the same group. How many games were played in Group A between South Africa, France, Uruguay and Mexico?

(A) 3 (B) 4 (C) 6 (D) 10 (E) 12

9. In die Wêreldbeker-sokker groepwedstryde speel elke span een keer teen elke ander span in dieselfde groep. Hoeveel wedstryde is in Groep A tussen Suid-Afrika, Frankryk, Uruguay en Mexico gespeel?

10. Five identical rectangles fit together to form a figure as shown. What is the area of the figure?

10. Vyf identiese reghoeke pas saam om ’n figuur te vorm soos getoon. Wat is die oppervlakte van die figuur?



(A) 270 cm^2 (B) 300 cm^2 (C) 330 cm^2 (D) 360 cm^2 (E) 450 cm^2

11. Patrick Green’s initials are PG. Hannah Brown's initials are HB. A firm makes handkerchiefs with all possible combinations of two initials. How many different combinations are possible?

(A) 676 (B) 338 (C) 52 (D) 650 (E) 625

11. Patrick Green se voorletters is PG. Hannah Brown se voorletters is HB. ’n Fabriek vervaardig sakdoeke met twee voorletters daarop. Hoeveel verskillende kombinasies van twee voorletters is moontlik?

12. 4920 people visited a fair on Sunday. This was 20% more than the number of visitors on Friday. How many visitors were there on Friday?

12. 4920 mense het Sondag die kermis bygewoon. Dit was 20% meer as die getal besoekers op Vrydag. Hoeveel besoekers was daar op Vrydag?

(A) 3936 (B) 4100 (C) 3978 (D) 4280 (E) None of these / Nie een hiervan nie

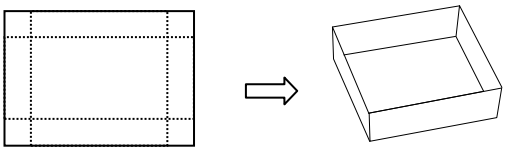
13. A reservoir is $\frac{5}{8}$ full. If 135 litres of water is added, the reservoir is $\frac{8}{11}$ full. What is the capacity (in litres) of the reservoir when full?

13. 'n Watertenk is $\frac{5}{8}$ vol. Nadat nog 135 liter water bygetap is, is die tenk $\frac{8}{11}$ vol. Hoeveel water hou die tenk (hoeveel liter)?

(A) 16 (B) 88 (C) 729 (D) 1 320 (E) 3 520

14. Four squares are cut from the corners of a rectangular sheet of cardboard. It is then folded up to make a box that is 15 cm long and 8 cm wide with a volume of 120 cm^3. What was the area of the original sheet of cardboard?

14. Vier vierkante word uit die hoeke van 'n reghoekige stuk karton gesny. Die karton word dan opgevou om 'n boks te maak wat 15 cm lank en 8 cm wyd is met 'n volume van 120 cm^3. Wat was die oppervlakte van die oorspronklike stuk karton?



(A) 144 cm^2 (B) 143 cm^2 (C) 170 cm^2 (D) 120 cm^2 (E) 240 cm^2

15. In this magic square the sum of the three numbers in each row, in each column and in each diagonal is 18. What is the value of z?

15. In hierdie towervierkant is die som van die drie getalle in elke ry, in elke kolom en in elke skuinslyn gelyk aan 18. Wat is die waarde van z?

		z
11	6	
		10

(A) 1 (B) 3 (C) 9 (D) 7 (E) 8

16. In this multiplication magic square the *product* of the three numbers in each row, in each column and in each diagonal is 1. What is the value of $r + s$?

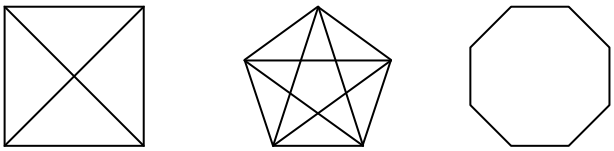
16. In hierdie vermenigvuldigings towervierkant is die *produk* van die drie getalle in elke ry, in elke kolom en in elke skuinslyn gelyk aan 1. Wat is die waarde van $r + s$?

p	q	r
s	1	t
u	4	$\frac{1}{8}$

(A) $\frac{1}{2}$ (B) $\frac{9}{16}$ (C) $\frac{5}{4}$ (D) $\frac{33}{16}$ (E) 24

17. A square has 2 diagonals and a pentagon has 5. How many diagonals does an octagon have? (An octagon has 8 sides.)

17. 'n Vierkant het 2 hoeklyne en 'n vyfhoek het 5. Hoeveel hoeklyne het 'n agthoek?



(A) 20 (B) 28 (C) 16 (D) 24 (E) 40

18. How many diagonals does an 80-gon have?

(A) 6160 (B) 200 (C) 400 (D) 3080 (E) None of these

18. Hoeveel hoeklyne het ’n 80-hoek?

(A) 6160 (B) 200 (C) 400 (D) 3080 (E) Nie een hiervan nie

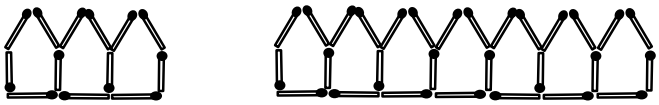
19. The sum of seven single-digit positive whole numbers is 17. If six of these numbers are equal, what is the other number?

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

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

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

20. John builds houses as shown. When there are 3 houses, there are 13 matches. When there are 7 houses, there are 29 matches. How many matches does he need to make 20 such houses?



(A) 80 (B) 81 (C) 85 (D) 84 (E) 83

20. John bou huisies soos getoon. Vir 3 huise gebruik hy 13 vuurhoutjies en vir 7 huise 29 vuurhoutjies. Hoeveel vuurhoutjies gebruik hy vir 20 sulke huise?

21. In question 20: If John has 225 matches, how many such houses can he build if he uses all the matches?

(A) 50 (B) 52 (C) 54 (D) 56 (E) 58

21. In vraag 20: As John 225 vuurhoutjies het, hoeveel sulke huise kan hy bou as hy al die vuurhoutjies gebruik?

(A) 50 (B) 52 (C) 54 (D) 56 (E) 58

22. Which of these statements is false?

(A) All squares are rectangles
(B) All rectangles are quadrilaterals
(C) All rectangles are parallelograms
(D) All squares are quadrilaterals
(E) All rectangles are squares

22. Watter van hierdie bewerings is onwaar?

(A) Alle vierkante is reghoeke
(B) Alle reghoeke is vierhoeke
(C) Alle reghoeke is parallelogramme
(D) Alle vierkante is vierhoeke
(E) Alle reghoeke is vierkante

23. In how many different ways can the five people be arranged in a line next to each other for the photograph?

(A) 5 (B) 25 (C) 50 (D) 120 (E) None of these

23. Op hoeveel verskillende maniere kan die vyf mense in ’n lyn langs mekaar gerangskik word vir die foto?

(A) 5 (B) 25 (C) 50 (D) 120 (E) Nie een hiervan nie

24. Which one of the following numbers will appear in the sequence

3; 8; 15; 24; 35; 48; ...?

(A) 901 (B) 902 (C) 903 (D) 904 (E) None of these

24. Watter een van die volgende getalle sal voorkom in die getalry

3; 8; 15; 24; 35; 48; ...?

(A) 901 (B) 902 (C) 903 (D) 904 (E) Nie een hiervan nie

25. The famous mathematician Augustus De Morgan who lived in the nineteenth century, of joked that he was x years old in the year x^2. In what year was he born?

(A) 1849 (B) 1825 (C) 1812 (D) 1836 (E) 1806

25. Die beroemde wiskundige Augustus De Morgan, wat in die negentiende eeu geleef het, het dikwels vertel dat hy x jaar oud was in die jaar x^2. In watter jaar is hy gebore?

(A) 1849 (B) 1825 (C) 1812 (D) 1836 (E) 1806