

SA Mathematics Challenge 2013
GRADE 7 FINAL ROUND
4 SEPTEMBER 2013

SA Wiskunde-uitdaging 2013
GRAAD 7 FINALE RONDE
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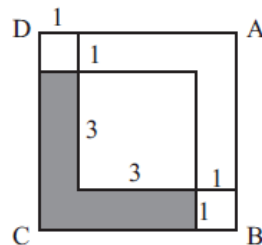
NOTE:

- 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!

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. Figure ABCD is a square. Inside this square three smaller squares are drawn with side lengths (in centimetres) as labelled. What is the area of the shaded L-region?



- (A) 7 cm^2 (B) 10 cm^2 (C) $12,5 \text{ cm}^2$ (D) 14 cm^2 (E) 15 cm^2

2. What is the perimeter of the shaded L-region in question 1?

- (A) 14 cm (B) 10 cm (C) 12 cm (D) 16 cm (E) None of these
 Nie een hiervan nie

3. Calculate:

$$2 - 1 + 3 - 2 + 4 - 3 + 5 - 4 + 6 - 5 + \dots + 101 - 100$$

- (A) 99 (B) 100 (C) 101

2. Wat is die omtrek van die verdonkerde L-gebied in vraag 1?

3. Bereken:

$$2 - 1 + 3 - 2 + 4 - 3 + 5 - 4 + 6 - 5 + \dots + 101 - 100$$

- (D) 102 (E) None of these
 Nie een hiervan nie

4. The number 64 has the property that it is divisible by its units digit (4). How many whole numbers between 10 and 50 have this property?

- (A) 15 (B) 16 (C) 17 (D) 18 (E) 20

4. Die getal 64 het die eienskap dat dit deelbaar is deur sy eenes-syfer (4). Hoeveel heelgetalle tussen 10 en 50 het hierdie eienskap?

5. What is the 83rd number in the following pattern?

1; 3; 5; 7; ...

- (A) 85 (B) 165 (C) 62

5. Wat is die 83^{ste} getal in die volgende patroon?

1; 3; 5; 7; ...

- (D) 97 (E) 102



6. In the magic square below the sum of the three numbers in each row, in each column and in each diagonal is 18. What number is x ?

		x
11	6	
		10

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

6. In die towervierkant hieronder is die som van die drie getalle in elke ry, in elke kolom en in elke hoeklyn gelyk aan 18. Watter getal is x ?

7. Calculate:

$$\frac{24 \times 18 \times 15 + 24 \times 18 \times 13 + 24 \times 18 \times 7}{24 \times 18}$$

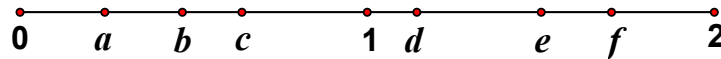
- (A) $\frac{35}{36}$ (B) 35 (C) 11 340

7. Bereken:

$$\frac{24 \times 18 \times 15 + 24 \times 18 \times 13 + 24 \times 18 \times 7}{24 \times 18}$$

- (D) 75 355 (E) None of these
Nie een hiervan nie

8. On this number line, which value could best represent $b \times c$?



- (A) a (B) 1 (C) d (D) e (E) f

8. Op hierdie getallelyn, watter waarde kan $b \times c$ die beste voorstel?

9. The average of eleven numbers is 8. If a twelfth number is added to these numbers, the average of all twelve numbers is now 11. What is the twelfth number?

- (A) 11 (B) 12 (C) 33

9. Die gemiddelde van elf getalle is 8. As 'n twaalfde getal by hierdie getalle gevoeg word, is die gemiddelde van al twaalf getalle nou 11. Wat is die twaalfde getal?

- (D) 44 (E) 22

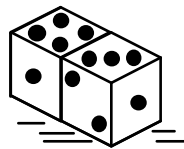
10. A water tank is $\frac{7}{8}$ full. After 420 litres had been drawn from it, it is half full. How many litres does the tank hold when it is full?

- (A) 1120 (B) 735 (C) 960

10. Uit 'n watertenk wat $\frac{7}{8}$ vol is, word 420 liter getap. Nou is die tenk halfvol. Hoeveel liter hou die tenk as dit vol is?

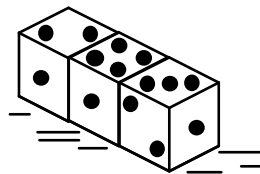
- (D) 367,5 (E) 840

11. 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. How many faces are visible with 30 dice in the row?



- (A) 110 (B) 92 (C) 900

11. As ons dobbelstene op 'n tafel in 'n ry teen mekaar pak, is net sommige sye sigbaar: Met 2 dobbelstene in die ry is 8 sye sigbaar; met 3 in die ry is 11 sye sigbaar, ens. Hoeveel sye is sigbaar met 30 dobbelstene in die ry?



- (D) 180 (E) 90

12. In question 11: If 50 faces are visible, how many dice are there in the row?

- (A) 12 (B) 13 (C) 14

12. In vraag 11: As 50 sye sigbaar is, hoeveel dobbelstene is daar in die ry?

- (D) 15 (E) 16

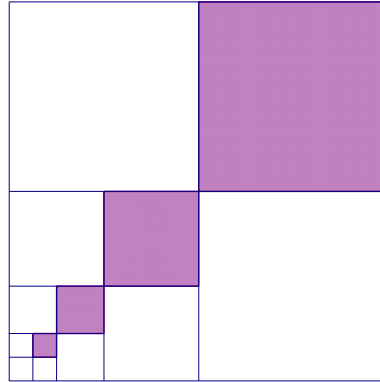
13. There are three children in a certain family. What is the probability that at least one of the three children is a girl?

(A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{8}$

13. 'n Familie het drie kinders. Wat is die waarskynlikheid dat minstens een van die drie kinders 'n meisie is?

(D) $\frac{3}{8}$ (E) $\frac{7}{8}$

14. A square is divided into four smaller equal squares, and the process is then repeated as shown. What fraction of the large square is shaded?



14. 'n Vierkant word in vier ewe-groot kleiner vierkante verdeel, en die proses word dan herhaal soos getoon. Watter breuk van die groot vierkant is verdonker?

(A) $\frac{1}{4}$ (B) $\frac{17}{64}$ (C) $\frac{85}{256}$ (D) $\frac{7}{16}$ (E) $\frac{65}{128}$

15. How many of the 5-digit numbers which consist of the five digits 1, 2, 3, 4 and 5 are divisible by all of 1, 2, 3, 4 and 5?

(A) 0 (B) 1 (C) 18

15. Hoeveel van die 5-syfer getalle wat bestaan uit die vyf syfers 1, 2, 3, 4 en 5 is deelbaar deur 1 en 2 en 3 en 4 en 5?

(D) 24 (E) 120

16. Find the number between 20 and 80 which meets all the following conditions:
it is a prime number
if you reverse its digits, this new number is also prime
if you add 1 to the number you get a multiple of 3

(A) 53 (B) 31 (C) 67

16. Vind die getal tussen 20 en 80 wat aan al die volgende voorwaardes voldoen:

dit is 'n priemgetal
as jy die syfers omruil, is die nuwe getal ook priem
as jy 1 by die getal tel kry jy 'n veelvoud van 3

(D) 71 (E) None of these
Nie een hiervan nie

17. What is the smallest number that is divisible by 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10?

(A) $3 \times 4 \times 5 \times 7 \times 9$ (B) $5 \times 7 \times 8 \times 9$ (C) $5 \times 6 \times 7 \times 8 \times 9$ (D) $5 \times 6 \times 8 \times 9$ (E) $2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9 \times 10$

17. Wat is die kleinste getal wat deelbaar is deur 1, 2, 3, 4, 5, 6, 7, 8, 9 en 10?

18. Excluding 1 and itself, how many factors does the number $19 \times 29 \times 59 \times 79$ have?

(A) 4 (B) 8 (C) 10

18. Behalwe 1 en die getal self, hoeveel faktore het die getal $19 \times 29 \times 59 \times 79$?

(D) 12 (E) 14

19. A painter takes two days to paint a room (all four walls and the ceiling). If he works at the same pace, how many days will he take to paint a room that is twice as wide, twice as long and twice as high?

(A) 2 (B) 4 (C) 5

19. 'n Verwer neem twee dae om 'n kamer te verf (al vier mure en die plafon). As hy teen dieselfde tempo werk, hoeveel dae sal hy verf aan 'n kamer twee keer so lank, twee keer so breed en twee keer so hoog?

(D) 6 (E) 8

20. Arnie, Bender and Cross are three robots. They are weighed two at a time. Here are the results:

$$A + B = 12 \text{ kg} \quad B + C = 14 \text{ kg} \quad C + A = 16 \text{ kg}$$

How much will all three weigh together?

- (A) 21 kg (B) 42 kg (C) 28 kg

20. Arnie, Bender en Cross is drie robotte. Hulle word twee op 'n slag geweeg. Hier is die lesings:

$$A + B = 12 \text{ kg} \quad B + C = 14 \text{ kg} \quad C + A = 16 \text{ kg}$$

Hoeveel sal al drie saam weeg?

- (D) 32 kg (E) 14 kg

21. In the previous question, how much does Bender weigh on its own?

- (A) 5 kg (B) 6 kg (C) 7 kg

21. In die vorige vraag, hoeveel weeg Bender op sy eie?

- (D) 8 kg (E) 9 kg

22. Calculate:

$$\frac{1 + 3 + 5 + 7 + \dots + 97 + 99}{2 + 4 + 6 + 8 + \dots + 98 + 100}$$

- (A) $\frac{50}{51}$ (B) $\frac{99}{100}$ (C) $\frac{49}{50}$

22. Bereken:

$$\frac{1 + 3 + 5 + 7 + \dots + 97 + 99}{2 + 4 + 6 + 8 + \dots + 98 + 100}$$

- (D) $\frac{1}{2}$ (E) None of these
Nie een hiervan nie

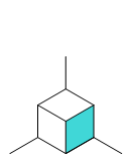
23. Xolile has a bag of marbles. He gave $\frac{1}{3}$ of them to Baba and then $\frac{1}{4}$ of the remaining marbles to Sam. If there are now 24 marbles in the bag, how many marbles did Xolile give to Baba?

- (A) 8 (B) 16 (C) 48

23. Xolile het 'n sak albasters. Hy gee $\frac{1}{3}$ van hulle aan Baba en gee toe $\frac{1}{4}$ van die oorblywende albasters aan Sam. As daar nou 24 albasters in die sak is, hoeveel albasters het Xolile aan Baba gegee?

- (D) 24 (E) None of these
Nie een hiervan nie

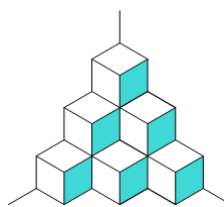
24. Blocks are stacked in the corner of a room as illustrated. How many blocks are used if they are stacked to 6 layers?



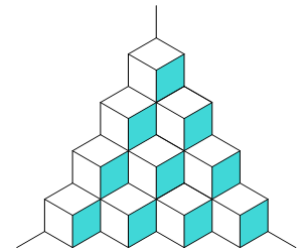
1 layer/laag



2 layers/lae



3 layers/lae



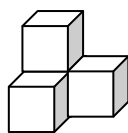
4 layers/lae

- (A) 35 (B) 56 (C) 36 (D) 45 (E) 21

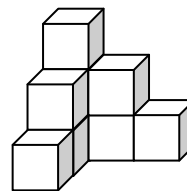
25. Siphokazi builds a pattern of cubes as shown. How many cubes will there be in *Pattern 20*?



Pattern 1



Pattern 2



Pattern 3

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