

# SA Mathematics Challenge 2016

## GRADE 7 FIRST ROUND

# SA Wiskunde-uitdaging 2016

## Graad 7 Eerste Ronde

### 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. What is the smallest number  $n$  so that  $150 \times n$  is a perfect square?

- (A) 2                      (B) 5                      (C) 6

1. Wat is die kleinste getal  $n$  sodat  $150 \times n$  'n vierkant is?

- (D) 24                      (E) 150

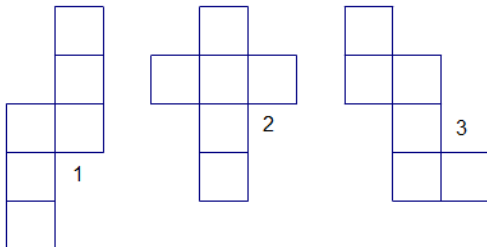
2. Numbers are arranged in rows and columns as below. This pattern continues. What is the first number in Row 6?

1	4	9	16	25	← Row/Ry 1
36	49	64	81	100	← Row/Ry 2
121	144	169	196	225	← Row/Ry 3
⋮					

- (A) 529                      (B) 625                      (C) 576                      (D) 676                      (E) 729

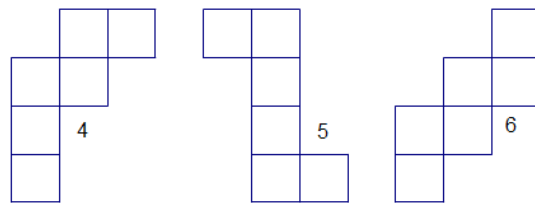
2. Getalle word in rye en kolomme gerangskik soos hieronder. Hierdie patroon word voortgesit. Wat is die eerste getal in Ry 6?

3. Which of these nets is not the net of a cube?



- (A) 1                      (B) 3                      (C) 4

3. Watter van hierdie nette is nie die net van 'n kubus nie?



- (D) 5                      (E) 6

4. If brackets are placed anywhere in the expression  $25 - 5 \times 3 - 1$ , which of these values can the expression not have?

- (A) 15                      (B) 59                      (C) 9

4. As hakies enige plek in die uitdrukking  $25 - 5 \times 3 - 1$  geplaas kan word, watter van hierdie waardes kan die uitdrukking nie aanneem nie?

- (D) 11                      (E) 13

5. Some numbers read the same when written forwards and backwards, for example 121. How many such numbers are there between 10 and 300?

- (A) 28                      (B) 29                      (C) 30

5. Sommige getalle lees dieselfde van voor en van agter, byvoorbeeld 121. Hoeveel sulke getalle is daar tussen 10 en 300?

- (D) 31                      (E) 32

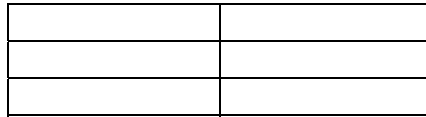
6. On a farm there are sheep and ducks. In all there are 40 heads and 124 legs. How many ducks are there?

- (A) 22                      (B) 20                      (C) 18

6. Daar is skape en eende op 'n plaas. Hulle het altesaam 40 koppe en 124 bene. Hoeveel eende is daar?

- (D) 21                      (E) 19

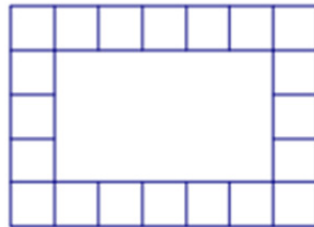
7. How many rectangles, of all sizes, are there in the rectangular figure below?



- (A) 9                      (B) 18                      (C) 24                      (D) 27                      (E) 36

7. Hoeveel reghoeke, van alle groottes, is daar in die reghoekige figuur hieronder?

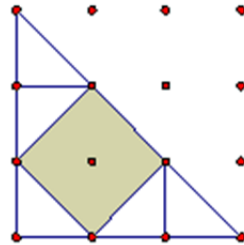
8. A rectangular swimming pool measuring  $12\text{ m} \times 8\text{ m}$  is to be surrounded by a row of square paving stones, of side 500 mm, as in this example of a different pool. How many paving stones will be needed?



- (A) 44                      (B) 40                      (C) 96                      (D) 38                      (E) 84

8. 'n Reghoekige swembad met afmetings van  $12\text{ m} \times 8\text{ m}$  moet omring word met 'n ry vierkantige teëls met sylengte 500 mm, soos in hierdie voorbeeld van 'n ander swembad. Hoeveel teëls word benodig?

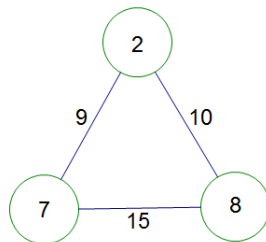
9. The diagram below has been drawn on square dot paper. The two shorter sides of the big right-angled triangle are equal. What fraction of the big triangle is shaded?



- (A)  $\frac{1}{2}$                       (B)  $\frac{2}{3}$                       (C)  $\frac{5}{9}$                       (D)  $\frac{3}{7}$                       (E)  $\frac{4}{9}$

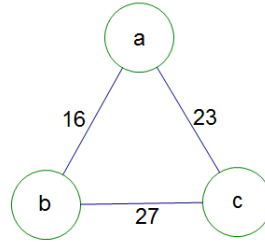
9. Die diagram hieronder is op vierkantige kolletjiespapier geteken. Die twee kort sye van die groot reghoekige driehoek is ewe lank. Watter breuk van die groot driehoek is verdonker?

10. In the diagrams below, each number on the lines connecting the circles is the sum of the two numbers in the adjoining circles. What is the value of  $a + b + c$ ?



- (A) 33                      (B) 49                      (C) 51

10. In die diagramme hieronder is elke getal op die sy van die driehoek gelyk aan die som van die twee getalle in die aangrensende sirkels. Wat is die waarde van  $a + b + c$ ?



- (D) 34                      (E) 36

11. Refer to question 10.  
What is the value of a?

- (A) 6                      (B) 9                      (C) 10

11. Verwys na vraag 10.  
Wat is die waarde van a?

- (D) 15                      (E) 17

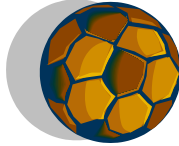
12. In three years, David will be three times my present age. I will then be half of David's age. How old am I now?

- (A) 3                      (B) 6                      (C) 9

12. Oor drie jaar sal David drie keer so oud wees as my huidige ouderdom. Ek sal dan die helfte so oud wees as David. Hoe oud is ek nou?

- (D) 12                      (E) 15

13. In a school, there are 4 houses: Alpha, Beta, Gamma and Delta. The inter-house soccer competition is arranged so that each house plays each of the other houses once. How many matches are played?



- (A) 3                      (B) 6                      (C) 8

13. In 'n skool word leerders in 4 spanne (kleurgroepe) verdeel: Goud, Groen, Ligblou en Donkerblou. In die kleure-sokkerkompetisie speel elke kleurgroep een keer teen elke ander kleurgroep. Hoeveel wedstryde word gespeel?

- (D) 10                      (E) 12

14. The digits 1 to 5 must be placed in the blocks below to form a 3-digit number and a 2-digit number, which are then multiplied:



All the digits must be used.  
What is the largest answer which can be obtained?

- (A) 22 876                      (B) 21 812                      (C) 22 403

14. Die syfers 1 tot 5 moet in die blokkies hieronder geplaas word om 'n 3-syfer getal en 'n 2-syfer getal te vorm, en die twee getalle word dan vermenigvuldig:



Al die syfers moet gebruik word.  
Wat is die grootste moontlike antwoord?

- (D) 22 302                      (E) 22 412

15. To solve this multiplication grid, place numbers 1 to 9 in the blocks. You must use all nine numbers.

The three numbers in each row are multiplied together to give the number on the right; the three numbers in each column are multiplied together to give the number at the bottom of the column.

What is the value of  $x$ ?

$x$			84
			45
			96
48	105	72	

- (A) 1                      (B) 2                      (C) 3                      (D) 4                      (E) 6

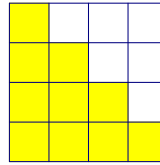
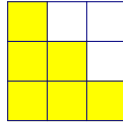
15. In hierdie vermenigvuldigingsprobleem word die getalle 1 tot 9 in die blokkies in die rooster hieronder geplaas. Al nege getalle moet gebruik word.

Die drie getalle in elke ry word vermenigvuldig en die antwoord in die regterkolom geskryf, en die drie getalle in elke kolom word vermenigvuldig en die antwoord in die onderste ry geskryf.

Wat is die waarde van  $x$ ?

16. In the  $2 \times 2$  grid below,  $\frac{3}{4}$  of the grid is shaded, in the  $3 \times 3$  grid,  $\frac{6}{9}$  of the grid is shaded, and in the  $4 \times 4$  grid,  $\frac{10}{16}$  of the grid is shaded.

If a  $20 \times 20$  grid was shaded in the same way, what fraction of the grid would be shaded?

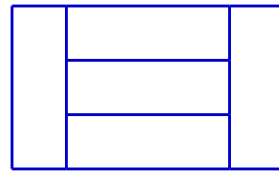


- (A)  $\frac{21}{40}$       (B)  $\frac{83}{125}$       (C)  $\frac{209}{400}$       (D)  $\frac{190}{256}$       (E)  $\frac{11}{20}$

16. In die  $2 \times 2$  vierkant hieronder is  $\frac{3}{4}$  van die vierkant verdonker, in die  $3 \times 3$  vierkant is  $\frac{6}{9}$  van die vierkant verdonker, en in die  $4 \times 4$  vierkant is  $\frac{10}{16}$  van die vierkant verdonker.

As 'n  $20 \times 20$  vierkant op dieselfde manier verdonker word, watter breuk van die vierkant is verdonker?

17. A large rectangle is made with five smaller identical rectangles, as shown. The area of the large rectangle is  $60 \text{ cm}^2$ . What is the perimeter of the large rectangle?

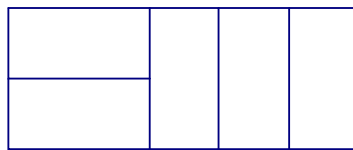


- (A) 32 cm      (B) 34 cm      (C) 38 cm      (D) 46 cm      (E) 64 cm

17. 'n Groot reghoek word gevorm met vyf kleiner identiese reghoeke soos getoon. Die oppervlakte van die groot reghoek is  $60 \text{ cm}^2$ . Wat is die omtrek van die groot reghoek?

18. A pathway measuring  $5 \text{ m} \times 2 \text{ m}$  is laid with five rectangular paving stones, each measuring  $2 \text{ m} \times 1 \text{ m}$ . One way in which the path could be paved is shown below.

In how many different ways can the path be laid (including the one shown)?



- (A) 5      (B) 7      (C) 8      (D) 9      (E) 10

18. 'n Paadtjie met afmetings  $5 \text{ m} \times 2 \text{ m}$  word gebou met vyf identiese reghoekige teëls met afmetings  $2 \text{ m} \times 1 \text{ m}$ . Hieronder is een manier hoe die teëls gelê kan word.

Op hoeveel verskillende maniere kan die teëls gelê word (insluitend die gegewe een)?

19. The sum of the digits of the year 2016 is  $2 + 0 + 1 + 6 = 9$ , which is a square number. In how many years, from the year 2000 to the year 2050, is the sum of the digits of the year a square number?

- (A) 7      (B) 8      (C) 9      (D) 10      (E) 11

19. Die som van die syfers van die jaar 2016 is  $2 + 0 + 1 + 6 = 9$ , wat 'n vierkantsgetal is. In hoeveel jare vanaf die jaar 2000 tot die jaar 2050 is die som van die syfers van die jaar 'n vierkant?

20. A five-star hotel has bought 70 treadmills and 42 exercise bikes for its exercise rooms. All the rooms must be identically equipped, with not more than 7 treadmills per room, and all exercise equipment should be used. How many exercise rooms are there in the hotel?

- (A) 7      (B) 14      (C) 28      (D) 10      (E) 2

20. 'n Vyfster hotel het 70 trapmeule en 42 oefenfiets vir hul oefenkamers gekoop. Al die kamers word identies toegerus, met nie meer as 7 trapmeule per kamer nie, en alle apparaat moet gebruik word. Hoeveel oefenkamers is daar in die hotel?