

# Mathematics Challenge 2008 GRADE 7 FIRST ROUND

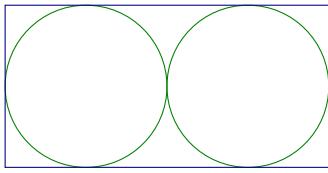
# Wiskunde-uitdaging 2008 GRAAD 7 EERSTE RONDE

**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!

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1. I multiplied two consecutive numbers (e.g. 4 and 5) on my calculator and got the answer 702. What is the sum of the two numbers?
- (A) 42      (B) 49      (C) 53      (D) 65      (E) 51
2. Which one of these is *not* true?
- (A)  $1 \times 1 \div 1 \times 1 = 1$     (B)  $2 \div 2 + 2 \div 2 = 2$     (C)  $3 \times 3 - 3 + 3 = 3$     (D)  $(4 - 4) \div 4 + 4 = 4$     (E)  $5 + 5 \times (5 - 5) = 5$
3. The figure consists of a square of side length 2 cm, with an equilateral triangle attached to each end. What is the perimeter of the figure?
- 
- (A) 10 cm      (B) 16 cm      (C) 12 cm      (D) 14 cm      (E) 8 cm
4. The sketch shows a rectangle that encloses two circles, each of radius 2 cm. What is the area of the rectangle?
- 
- (A)  $8 \text{ cm}^2$       (B)  $32 \text{ cm}^2$       (C)  $16 \text{ cm}^2$       (D)  $12 \text{ cm}^2$       (E)  $24 \text{ cm}^2$
5. Calculate the value of
- $$1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{3}}}$$
- (A)  $1\frac{4}{7}$       (B)  $\frac{4}{7}$       (C)  $1\frac{2}{3}$       (D)  $3\frac{1}{3}$       (E)  $5\frac{1}{3}$
- 
5. Bereken die waarde van
- $$1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{3}}}$$



6. Which of these fractions is the largest?

- (A)  $\frac{7}{15}$       (B)  $\frac{3}{7}$       (C)  $\frac{11}{23}$

6. Watter van hierdie breuke is die grootste?

- (D)  $\frac{4}{9}$       (E)  $\frac{5}{11}$

7. A teacher writes five numbers on the board. The five numbers have an average of 30. She then erases one of the numbers. The average of the four remaining numbers is 28. What number did she erase?

- (A) 32      (B) 10      (C) 8

7. 'n Onderwyseres skryf vyf getalle op die bord waarvan die gemiddelde 30 is. Dan vee sy een van die getalle uit. Die gemiddelde van die oorblywende vier getalle is 28. Watter getal het sy uitgegee?

- (D) 38      (E) One cannot know  
Mens kan nie sê nie

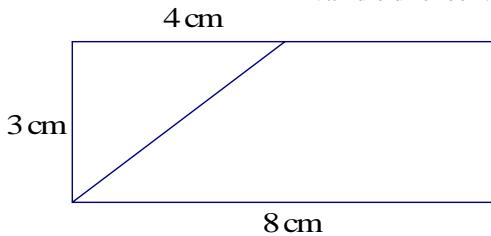
8. Speed and Moto are driving on the same highway in the same direction and both drive at a constant speed. Moto drives at 90 km/h and is 30 km ahead of Speed. If Speed drives at 100 km/h, how long will it take for Speed to catch Moto?

- (A) 18 min      (B) 1 h      (C) 2 h

8. Speed en Moto ry op dieselfde snelweg in dieselfde rigting en albei ry teen 'n konstante spoed. Moto ry teen 90 km/h en is 30 km voor Speed. As Speed teen 100 km/h ry, hoe lank sal dit vir Speed neem om Moto in te haal?

- (D) 3 h      (E) 4 h

9. A 3 cm by 8 cm rectangle is cut into 2 pieces as shown. The two pieces are then rearranged to form a right-angled triangle. How long is the shortest side of this triangle?



9. 'n 3 cm by 8 cm reghoek word in twee stukke gesny soos getoon. Die twee stukke word dan herraangskik om 'n reghoekige driehoek te vorm. Hoe lank is die kortste sy van die driehoek?

- (A) 9 cm      (B) 6 cm      (C) 4 cm      (D) 7 cm      (E) 5 cm

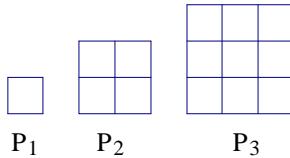
10. In question 9: What is the area of the newly formed triangle?

- (A)  $24 \text{ cm}^2$       (B)  $12 \text{ cm}^2$       (C)  $48 \text{ cm}^2$

10. In vraag 9: Wat is die oppervlakte van die nuwe driehoek?

- (D)  $32 \text{ cm}^2$       (E)  $16 \text{ cm}^2$

11. In the sketch below, Pattern 3 has nine squares and eight lines. If the pattern continues to grow, how many lines are there in  $P_{20}$ ?



- (A) 25      (B) 40      (C) 38      (D) 44      (E) 42

11. In die skets hieronder het Patroon 3 nege vierkante en agt lyne. As die patroon voortgesit word, hoeveel lyne is daar in  $P_{20}$ ?

12. In question 11, how many lines are there in the pattern with 64 squares?

- (A) 32      (B) 18      (C) 20      (D) 30      (E) 16

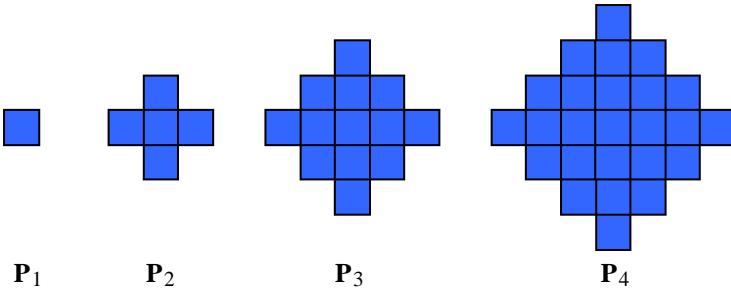
12. In vraag 11, hoeveel lyne is daar in die patroon met 64 vierkante?

13. In question 11, how many squares are there in the pattern with 64 lines?

- (A) 900      (B) 961      (C) 1024      (D) 128      (E) 841

13. In vraag 11, hoeveel vierkante is daar in die patroon met 64 lyne?

14. With one digit you can form one number, e.g. 9. With two digits you can form two numbers, e.g. 68 and 86. How many different four-digit numbers can be formed with four different digits?
- (A) 8      (B) 10      (C) 16      (D) 24      (E) 32
- 
15. Penny had a bag full of marbles. She gave one-third of the marbles to Manto, and then one-fourth of the remaining marbles to John. Penny then had 24 marbles left in the bag. How many marbles did she give Manto?
- (A) 12      (B) 24      (C) 48      (D) 16      (E) 15
- 
16. The areas of rectangles A, B and C below are  $12 \text{ cm}^2$ ,  $21 \text{ cm}^2$  and  $20 \text{ cm}^2$  respectively. What is the area of rectangle D?
- |   |   |
|---|---|
| A | C |
| B | D |
- (A)  $32 \text{ cm}^2$       (B)  $35 \text{ cm}^2$       (C)  $55 \text{ cm}^2$       (D)  $56 \text{ cm}^2$       (E)  $88 \text{ cm}^2$
- 
17. The length of a rectangle is four times as long as its width. The perimeter of the rectangle is 100 m. What is the area of the rectangle?
- (A)  $50 \text{ m}^2$       (B)  $40 \text{ m}^2$       (C)  $200 \text{ m}^2$       (D)  $100 \text{ cm}^2$       (E)  $400 \text{ m}^2$
- 
18. Numbers are arranged in the following pattern:
- |     |     |     |     |     |     |              |
|-----|-----|-----|-----|-----|-----|--------------|
| 1   | 2   | 3   | 4   | 5   | 6   | <b>row 1</b> |
| 7   | 8   | 9   | 10  | 11  | 12  | <b>row 2</b> |
| 13  | 14  | 15  | 16  | 17  | 18  | <b>row 3</b> |
| ... | ... | ... | ... | ... | ... | <b>row 4</b> |
- What will the third number in row 81 be?
- (A) 480      (B) 486      (C) 483      (D) 485      (E) 241
- 
19. In question 18, in which row will the number 4321 be?
- (A) 711      (B) 701      (C) 719      (D) 721      (E) 720
- 
20. Check this number pattern:
- $$1 = 1 \times 1$$
- $$1 + 3 = 2 \times 2$$
- $$1 + 3 + 5 = 3 \times 3$$
- $$1 + 3 + 5 + 7 = 4 \times 4$$
- Now calculate  
 $1 + 3 + 5 + 7 + \dots$  all the way up to ... + 97 + 99
- (A) 2500      (B) 10000      (C) 2401      (D) 50000      (E) 2601
- 
14. Met een syfer kan jy een getal vorm, bv. 9. Met twee syfers kan jy twee getalle vorm, bv. 68 en 86. Hoeveel verskillende viersyfer-getalle kan met vier verskillende syfers gevorm word?
- (D) 24      (E) 32
- 
15. Penny het 'n sak vol albasters. Sy gee een-derde van die albasters vir Manto, en toe een-kwart van die oorblywende albasters vir John. Penny het toe 24 albasters in die sak oor. Hoeveel albasters het sy vir Manto gegee?
- (D) 16      (E) 15
- 
16. Die oppervlakte van reghoek A, B en C hieronder is onderskeidelik  $12 \text{ cm}^2$ ,  $21 \text{ cm}^2$  en  $20 \text{ cm}^2$ . Wat is die oppervlakte van reghoek D?
- (A)  $32 \text{ cm}^2$       (B)  $35 \text{ cm}^2$       (C)  $55 \text{ cm}^2$       (D)  $56 \text{ cm}^2$       (E)  $88 \text{ cm}^2$
- 
17. Die lengte van 'n reghoek is vier keer so lank as sy breedte. Die omtrek van die reghoek is 100 m. Wat is die oppervlakte van die reghoek?
- (D)  $100 \text{ cm}^2$       (E)  $400 \text{ m}^2$
- 
18. Getalle word in die volgende patroon rangskik:
- |     |     |     |     |     |     |             |
|-----|-----|-----|-----|-----|-----|-------------|
| 1   | 2   | 3   | 4   | 5   | 6   | <b>ry 1</b> |
| 7   | 8   | 9   | 10  | 11  | 12  | <b>ry 2</b> |
| 13  | 14  | 15  | 16  | 17  | 18  | <b>ry 3</b> |
| ... | ... | ... | ... | ... | ... | <b>ry 4</b> |
- Wat sal die derde getal in ry 81 wees?
- (D) 485      (E) 241
- 
19. In vraag 18, in watter ry sal die getal 4321 wees?
- (D) 721      (E) 720
- 
20. Kontroleer hierdie getalpatroon:
- $$1 = 1 \times 1$$
- $$1 + 3 = 2 \times 2$$
- $$1 + 3 + 5 = 3 \times 3$$
- $$1 + 3 + 5 + 7 = 4 \times 4$$
- Bereken nou  
 $1 + 3 + 5 + 7 + \dots$  al die pad tot by ... + 97 + 99
- (A) 2500      (B) 10000      (C) 2401      (D) 50000      (E) 2601

- 
- |  |   |
|--|---|
| 21. How many two-digit numbers are there with both digits odd? | 21. Hoeveel tweesyfer-getalle is daar met beide syfers onewe? |
|--|---|
- |        |        |        |        |        |
|--------|--------|--------|--------|--------|
| (A) 20 | (B) 25 | (C) 45 | (D) 50 | (E) 30 |
|--------|--------|--------|--------|--------|
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- |  |   |
|--|---|
| 22. Lee buys two drinks and one ice-cream for R15. Kim buys one drink and two ice-creams for R12. How much will Mario pay for one drink and one ice-cream? | 22. Lee koop twee koeldranke en een roomys vir R15. Kim koop een koeldrank en twee roomyse vir R12. Hoeveel sal Mario betaal vir een koeldrank en een roomys? |
|--|---|
- |         |         |        |        |         |
|---------|---------|--------|--------|---------|
| (A) R12 | (B) R11 | (C) R8 | (D) R9 | (E) R10 |
|---------|---------|--------|--------|---------|
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- |   |  |
|---|--|
| 23. In question 22, what does a drink cost? | 23. In vraag 22, wat kos 'n koeldrank? |
|---|--|
- |        |        |        |        |           |
|--------|--------|--------|--------|-----------|
| (A) R6 | (B) R3 | (C) R9 | (D) R4 | (E) R5,50 |
|--------|--------|--------|--------|-----------|
- 
- |   |   |
|---|---|
| 24. A man and his daughter together weigh 90 kg, the man with his cat weigh 70 kg, and the daughter and cat together weigh 40 kg. What do the man, daughter and cat weigh together? | 24. 'n Man en sy dogter weeg saam 90 kg, die man en sy kat weeg saam 70 kg, en die dogter en die kat weeg saam 40 kg. Wat weeg die man, dogter en kat saam? |
|---|---|
- |           |            |            |            |  |
|-----------|------------|------------|------------|--|
| (A) 95 kg | (B) 100 kg | (C) 102 kg | (D) 105 kg | (E) None of these<br>Nie een hiervan nie |
|-----------|------------|------------|------------|--|
- 
- |  |  |
|--|--|
| 25. Sipho uses tiles to build patterns as shown below. How many tiles will he use for $P_{50}$ ? | 25. Sipho bou patronen met teëls soos hieronder. Hoeveel teëls sal hy gebruik vir $P_{50}$ ? |
|--|--|
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**P<sub>1</sub>**      **P<sub>2</sub>**      **P<sub>3</sub>**      **P<sub>4</sub>**
- |          |          |          |          |          |
|----------|----------|----------|----------|----------|
| (A) 2500 | (B) 2401 | (C) 4901 | (D) 5000 | (E) 5001 |
|----------|----------|----------|----------|----------|
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