Jet SA Mathematics Challenge

GRADE 7 FIRST ROUND
AUGUST 2011

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!

Jet SA Wiskunde-uitdaging

GRAAD 7 EERSTE RONDE
AUGUSTUS 2011

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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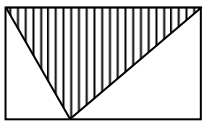
1. The sketch shows a 6 cm by 4 cm rectangle. What is the area of the shaded region?



(A) 12 cm^2 (B) 10 cm^2 (C) 9 cm^2 (D) 8 cm^2 (E) 7 cm^2

1. Die skets toon 'n 6 cm by 4 cm reghoek. Wat is die oppervlakte van die verdonkerde gebied?

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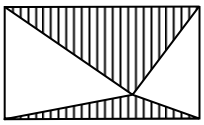
2. The sketch shows a 6 cm by 4 cm rectangle. What is the area of the shaded region?



(A) 12 cm^2 (B) 10 cm^2 (C) 9 cm^2 (D) 8 cm^2 (E) 7 cm^2

2. Die skets toon 'n 6 cm by 4 cm reghoek. Wat is die oppervlakte van die verdonkerde gebied?

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3. Calculate the value of

$$1+\frac{1}{1+\frac{1}{1+\frac{1}{2}}}$$

(A) $5\frac{1}{2}$ (B) $\frac{5}{8}$ (C) $1\frac{2}{3}$ (D) $3\frac{1}{2}$ (E) $1\frac{3}{5}$

3. Bereken die waarde van

$$1+\frac{1}{1+\frac{1}{1+\frac{1}{2}}}$$

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4. A rectangle is formed by three squares, all of the same size, as shown in the diagram. If the perimeter of this rectangle is 24 cm, what is the area of the rectangle?

(A) 27 cm^2 (B) 30 cm^2 (C) 36 cm^2 (D) 24 cm^2 (E) 48 cm^2

4. 'n Reghoek bestaan uit drie ewe-groot vierkante, soos getoon. As die omtrek van hierdie reghoek 24 cm is, wat is die oppervlakte van die reghoek?

SAMF
SOUTH AFRICAN MATHEMATICS FOUNDATION

Jet

AMESA
The Association for Mathematics Education of South Africa

5. What is the size of the angle between the hands of a clock at 17:00?

(A) 150° (B) 120° (C) 195° (D) 145° (E) 160°

5. Wat is die grootte van die hoek tussen die arms van 'n klok om 17:00?

6. Which one of these numbers has an odd number of factors?

(A) 33 (B) 34 (C) 35 (D) 36 (E) 37

6. Watter een van hierdie getalle het 'n onewe aantal faktore?

7. The average mass of 4 boys is 75 kg. The average mass of 6 girls is 65 kg. What is the average mass of the 10 children together?

(A) 70,5 kg (B) 66 kg (C) 70 kg (D) 69 kg (E) 74 kg

7. Die gemiddelde massa van 4 seuns is 75 kg. Die gemiddelde massa van 6 meisies is 65 kg. Wat is die gemiddelde massa van die 10 kinders saam?

8. $\dfrac{20+18+16+14+12+10+8+6+4+2}{10+9+8+7+6+5+4+3+2+1} =$

(A) 2 (B) 20 (C) $\frac{1}{2}$ (D) $\frac{19}{11}$ (E) $\frac{108}{55}$

8. $\dfrac{20+18+16+14+12+10+8+6+4+2}{10+9+8+7+6+5+4+3+2+1} =$

9. 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
1 laag

2 layers
2 lae

3 layers
3 lae

4 layers
4 lae

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

9. Blokkies word in die hoek van 'n kamer gestapel soos getoon. Hoeveel blokkies sal daar in 'n stapel met 6 lae wees?

10. How many whole numbers n are there such that $2 < 3\times n < 13$?

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

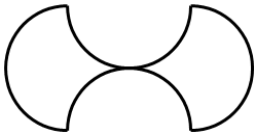
10. Hoeveel heelgetalle n is daar sodat $2 < 3\times n < 13$?

11. A sports team has won 70% of the 20 matches played so far. How many of the remaining 10 matches must it win to have an 80% win record for the season?

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

11. 'n Sportspan het 70% van die 20 wedstryde wat hulle sover gespeel het gewen. Hoeveel van die oorblywende 10 wedstryde moet hulle wen om 'n 80% wenrekord vir die seisoen te hê?

12. The figure is a combination of four semi-circles, each with a radius of 3 cm. What is the area of the figure?



(A) 24 cm^2 (B) 9 cm^2 (C) 36 cm^2 (D) 27 cm^2 (E) None of these
Nie een hiervan nie

12. Die figuur is 'n samestelling van vier semisirkels, elk met 'n radius van 3 cm. Wat is die oppervlakte van die figuur?

13. *a, b, c* and *d* are four adjacent dates in a calendar as shown. Which statement is NOT true for *any* calendar?

13. *a, b, c* en *d* is vier aangrensende datums in 'n kalender soos hieronder. Watter bewering is NIE waar vir *enige* kalender nie?

Sun	Mon	Tues	Wed	Thu	Fri	Sat
		a	*b*			
		c	*d*			

(A) $c - a = d - b$ (B) $c = a + 7$ (C) $d = a + 8$ (D) $a + c = b + d$ (E) $a + d = c + b$

14. In the above calendar, $a + b + c + d = 52$. What is $a + b$?

14. In die kalender hierbo is $a + b + c + d = 52$. Wat is $a + b$?

(A) 19 (B) 25 (C) 26 (D) 27 (E) One cannot say / Mens kan nie sê nie

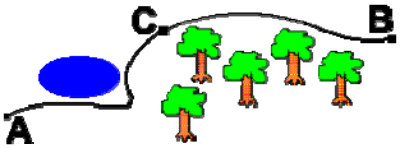
15. In a certain week on a calendar, the sum of all the dates in the week (Sunday to Saturday) is 112. What is the date on Friday?

15. In 'n sekere week op 'n kalender is die som van al die datums in die week (Sondag tot Saterdag) 112. Wat is die datum op die Vrydag?

(A) 19 (B) 17 (C) 16 (D) 18 (E) 12

16. Points A and B on the map are 12 km apart if you follow the path. A group of hikers leaves point A at 11:00. They are all carrying packs and travel at 4 km/h until they reach point C at 12:45. How fast will they have to go now if they want to reach point B by 14:00?

16. Punte A en B op die kaart is 12 km uitmekaar as 'n mens die pad volg. 'n Groep stappers verlaat punt A om 11:00. Hulle dra almal rugsakke en loop teen 4 km/h tot hulle punt C om 12:45 bereik. Teen watter spoed moet hulle nou stap as hulle punt B om 14:00 will bereik?



(A) 6 km/h (B) 5 km/h (C) 4 km/h (D) 3 km/h (E) None of these / Nie een hiervan nie

17. Three pencils and five books cost R44 altogether. One pencil and one book cost R10 altogether. What is the price of a book?

17. Drie potlode en vyf boeke kos saam R44. Een potlood en een boek kos saam R10. Wat kos 'n boek?

(A) R6,50 (B) R7 (C) R7,50 (D) R8 (E) R8,50

18. If a coin is tossed, the probability that it will land heads up is $\frac{1}{2}$ or 50%. What is the probability that in four successive tosses, the coin lands heads up each time?

18. As 'n muntstuk opgeskiet word, is die waarskynlikheid dat dit kruis ("kop") na bo val $\frac{1}{2}$ of 50%. As die muntstuk vier keer opgeskiet word, wat is die waarskynlikheid dat dit elke keer kruis land?

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{1}{8}$ (D) $\frac{1}{16}$ (E) None of these / Nie een hiervan nie

19. *Row 1*: $1 + 2 + 3 + 4 = 10$
Row 2: $3 + 4 + 5 + 6 = 18$
Row 3: $5 + 6 + 7 + 8 = 26$
Row 4: $7 + 8 + 9 + 10 = 34$
What is the sum of the numbers in *Row 30*?

19. *Ry 1*: $1 + 2 + 3 + 4 = 10$
Ry 2: $3 + 4 + 5 + 6 = 18$
Ry 3: $5 + 6 + 7 + 8 = 26$
Ry 4: $7 + 8 + 9 + 10 = 34$
Wat is die som van die getalle in *Ry 30*?

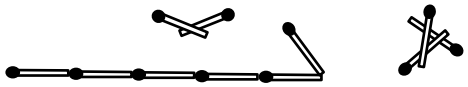
(A) 66 (B) 126 (C) 120 (D) 242 (E) 300

20. How many two-digit numbers are there with both digits even (e.g. 26)?

(A) 20 (B) 25 (C) 45 (D) 50 (E) 30

20. Hoeveel tweesyfer-getalle is daar met beide syfers ewe (bv. 26)?

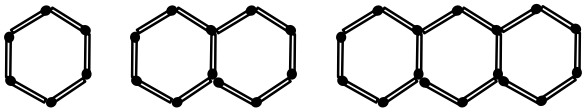
21. How many different triangles can you build with 11 whole matches, using all the matches? Note: the order of the sides does not matter, e.g. the triangles with sides 5, 5, 1 and 5, 1, 5 are the same.



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

21. Hoeveel verskillende driehoeke kan jy met 11 heel vuurhoutjies bou as jy al die vuurhoutjies gebruik? 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.

22. Zolile uses matches to build hexagon patterns as shown below. How many matches are there in pattern $\boldsymbol{P}_{50}$?



$\boldsymbol{P}_1$ $\boldsymbol{P}_2$ $\boldsymbol{P}_3$

(A) 298 (B) 300 (C) 301 (D) 251 (E) None of these / Nie een hiervan nie

22. Zolile bou seshoek-patrone met vuurhoutjies soos hieronder. Hoeveel vuurhoutjies is daar in patroon $\boldsymbol{P}_{50}$?

23. If the pattern below is continued, find the 10th fraction in this sequence:

$$\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}+\ldots$$

(A) $\frac{1}{60}$ (B) $\frac{1}{90}$ (C) $\frac{1}{100}$ (D) $\frac{1}{110}$ (E) $\frac{1}{80}$

23. As die patroon hieronder voortgesit word, vind die 10de breuk in die ry:

$$\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}+\ldots$$

24. In the previous question , find the sum of these 10 fractions.

(A) $\frac{10}{11}$ (B) $\frac{9}{10}$ (C) $\frac{109}{110}$ (D) $\frac{29}{30}$ (E) $\frac{53}{60}$

24. In die vorige vraag, vind die som van hierdie 10 breuke.

25. $(1-\frac{1}{2})\times(1-\frac{1}{3})\times(1-\frac{1}{4})\times(1-\frac{1}{5})\times\ldots\times(1-\frac{1}{2011})=$

(A) $\frac{1}{2011}$ (B) $\frac{2010}{2011}$ (C) $\frac{1}{1006}$ (D) $\frac{2011}{2010}$ (E) $\frac{1}{1005}$

25. $(1-\frac{1}{2})\times(1-\frac{1}{3})\times(1-\frac{1}{4})\times(1-\frac{1}{5})\times\ldots\times(1-\frac{1}{2011})=$