Fakulteit Natuur- & Landbouwetenskappe

Faculty of Natural & Agricultural Sciences

Department of Mathematics and Applied Mathematics

Departement Wiskunde en Toegepaste Wiskunde

MATHEMATICS COMPETITION **WISKUNDE KOMPETISIE**

GRADES 8 AND 9

GRADE 8 EN 9

AUGUST 2015

TIME: 2 HOURS

AUGUSTUS 2015

TYD: 2 URE

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

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INSTRUCTIONS

- No calculators or other calculation aids are allowed.

- **Mark allocation**
  Every question counts 1 mark.
  Random guessing is not advisable, as the mark allocated to a question may be deducted for a wrong answer.

- Every question has five possible answers, (**A**) to (**E**).
  Only **ONE** answer is correct.
  Colour in the rectangle of the correct answer on the answer sheet.
  Do not colour outside the rectangle.
  Use a soft pencil.

Example:
Suppose Question 21 reads:
The smallest integer larger than 1 is

(**A**) 0 (**B**) -1 (**C**) 1 (**D**) 2 (**E**) 3

The correct answer is 2, which is answer (**D**).
On the answer sheet you must colour in the rectangle (**D**) against Question 21.

Question 21 / Vraag 21 (**A**) (**B**) (**C**) (**D**) (**E**)

INSTRUKSIES

- Geen sakrekenaars of ander rekenhulpmiddels word toegelaat nie.

- **Puntetoekenning**
  Elke vraag tel 1 punt.
  Raaiery word nie aanbeveel nie, aangesien die punt toegeken aan die vraag afgetrek mag word vir ’n ’n verkeerde antwoord.

- Elke vraag het vyf moontlike antwoorde, (**A**) tot (**E**).
  Slegs **EEN** antwoord is korrek.
  Kleur die reghoek van die korrekte antwoord op die antwoordvel in.
  Moenie buite die reghoek inkleur nie.
  Gebruik ’n sagte potlood.

Voorbeeld:
Gestel Vraag 21 is:
Die kleinste heelgetal groter as 1 is

(**A**) 0 (**B**) -1 (**C**) 1 (**D**) 2 (**E**) 3

Die korrekte antwoord is 2, en dit is antwoord (**D**).
Op die antwoordvel moet jy die reghoek (**D**) inkleur teenoor Vraag 21.

Question 21 / Vraag 21 (**A**) (**B**) (**C**) (**D**) (**E**)

Question 1

If $a \star b = ab + \frac{a}{b}$, then $6 \star 2$ equals

(**A**) 39 (**B**) 12 (**C**) 11 (**D**) 15 (**E**) $12\frac{1}{3}$

Vraag 1

As $a \star b = ab + \frac{a}{b}$, dan is $6 \star 2$ gelyk aan

Question 2

If $2 - \frac{x}{3} = 5$, then x equals

(**A**) 9 (**B**) -9 (**C**) 6 (**D**) -21 (**E**) 21

Vraag 2

As $2 - \frac{x}{3} = 5$, dan is x gelyk aan

Question 3

What is the remainder when 2015 is divided by 19?

(**A**) 1 (**B**) 4 (**C**) 14 (**D**) 15 (**E**) 17

Vraag 3

Wat is die res as 2015 gedeel word deur 19?

Question 4

Sipho found a circle whose circumference and area has the same numerical value. What is the radius of the circle?

(**A**) 1 (**B**) 2 (**C**) π (**D**) $\sqrt{2}$ (**E**) $\sqrt{\pi}$

Vraag 4

Sipho het 'n sirkel gevind wat dieselfde numeriese waarde vir die omtrek en oppervlakte het. Wat is die radius van die sirkel?

Question 5

$(0,2)^3 =$

(**A**) $0,6$ (**B**) $0,06$ (**C**) $0,8$ (**D**) $0,08$ (**E**) $0,008$

Vraag 5

$(0,2)^3 =$

Question 6

How many weeks are there in $8! = 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ minutes?

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

Vraag 6

Hoeveel weke is daar in $8! = 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ minute?

Question 7

If 20% of a number is 12, what is 30% of the same number?

(**A**) 15 (**B**) 18 (**C**) 20 (**D**) 24 (**E**) 30

Vraag 7

As 20% van 'n getal 12 is, wat is 30% van dieselfde getal?

Question 8

Which of the expressions below is equal to $(x \div (y \div z)) \div ((x \div y) \div z)$?

(**A**) 1 (**B**) $\frac{1}{xyz}$ (**C**) x^2 (**D**) y^2 (**E**) z^2

Vraag 8

Watter van die volgende uitdrukkings is gelyk aan $(x \div (y \div z)) \div ((x \div y) \div z)$?

Question 9

If p is an integer, which of the following will be an even number?

(**A**) $4p - 3$ (**B**) $p^2 - p + 3$ (**C**) $p^3 - p + 1$ (**D**) $4p^2 - 1$ (**E**) $p^2 - 3p$

Vraag 9

As p 'n heelgetal is, watter een van die volgende sal 'n ewe getal wees?

Question 10

The angles of 'n triangle is in the ratio 3 : 4 : 5. What is the size of the biggest angle in degrees?

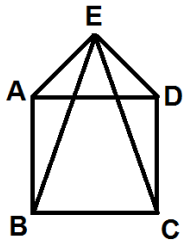
(**A**) 45 (**B**) 50 (**C**) 60 (**D**) 75 (**E**) 80

Vraag 10

Die hoeke van 'n driehoek is in die verhouding 3 : 4 : 5. Wat is die grootte van die grootste hoek van die driehoek in grade?

Question 11

ABCD is a square and ADE is an equilateral triangle. Find the size of $\angle BEC$.



(**A**) 15° (**B**) 20° (**C**) 30° (**D**) 45° (**E**) 60°

Vraag 11

ABCD is 'n vierkant en ADE is 'n gelyksydige driehoek. Vind die grootte van $\angle BEC$.

Question 12

How many whole numbers are there between $\sqrt{8}$ and $\sqrt{80}$?

(**A**) 5 (**B**) 6 (**C**) 7 (**D**) 8 (**E**) 9

Vraag 12

Hoeveel heelgetalle is daar tussen $\sqrt{8}$ en $\sqrt{80}$?

Question 13

An aquarium has a rectangular base that measures 100 cm by 40 cm and has a height of 50 cm . The aquarium is filled with water to a depth of 29 cm. A rock with volume 2000 cm^3 is then placed in the aquarium and completely submerged. By how many centimeters does the water level rise?

(**A**) $0,125$ (**B**) $0,2$ (**C**) $0,25$ (**D**) $0,4$ (**E**) $0,5$

Vraag 13

'n Vistenk met 'n reghoekige basis, 100 cm by 40 cm, het 'n hoogte van 50 cm. Die vistenk word gevul met water tot 'n hoogte van 29 cm. 'n Klip met 'n volume van 2000 cm^3 word in die vistenk gesit sodat dit heeltemal onder water is. Met hoeveel centimer sal die water in die vistenk styf?

Question 14

Pretoria zoo buys x kg of meat per week to feed its lions. If each lion eats y kg of meat per day, how many lions are there in the zoo?

(**A**) $\frac{y}{x}$ (**B**) $\frac{7y}{x}$ (**C**) $\frac{x}{y}$ (**D**) $\frac{7x}{y}$ (**E**) $\frac{x}{7y}$

Vraag 14

Pretoria dieretuin koop x kg vleis per week om sy leeus te voer. As elke leeu y kg vleis elke dag eet, hoeveel leeus is daar in die dieretuin?

Question 15

Winnie thinks of a number in the set $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$. What is the chances that this number is a prime number?

(**A**) $\frac{1}{2}$ (**B**) $\frac{2}{5}$ (**C**) $\frac{3}{7}$ (**D**) $\frac{7}{20}$ (**E**) $\frac{3}{10}$

Vraag 15

Winnie dink aan 'n getal in die versameling $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$. What is kans dat sy aan 'n priemgetal dink?

Question 16

If U and P are real numbers such that $U + P = 6$ and $U \times P = 6$, what is $(U - P)^2$?

(**A**) 12 (**B**) 18 (**C**) 6 (**D**) 24 (**E**) 0

Vraag 16

As U en P reële getalle is sodat $U + P = 6$ en $U \times P = 6$, wat is $(U - P)^2$?

Question 17

A bottle containing 250 tablets weighs 200g. The same bottle containing 200 tablets weighs 185g. How much does the empty bottle weigh (in grams)?

(**A**) 108 (**B**) 120 (**C**) 125 (**D**) 130 (**E**) 151

Vraag 17

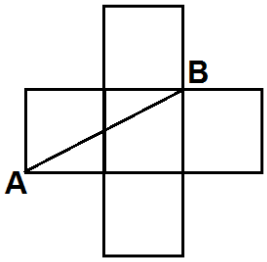
'n Bottel wat 250 tablette bevat weeg 200g. As dieselfde bottel 200 tablette bevat, weeg dit 185g. Hoeveel weeg die bottel (in gram) as dit leeg is?

Question 18

The figure shows five squares. What is the area of the figure if $AB = 6$ units?

Vraag 18

Die figuur bevate vyf vierkante. Wat is die area van die figuur as $AB = 6$ eenhede?



(**A**) 12 (**B**) 24 (**C**) 30 (**D**) 36 (**E**) 42

Question 19

A slow train travelling from Springs to Soweto arrives 9 minutes late when traveling at 36 km/h. If it travels at 27 km/h it arrives 39 minutes late. What is the distance between Springs and Soweto in kilometers?

Vraag 19

'n Stadige trein ry van Springs na Soweto. As dit teen 36 km/h ry, sal dit 9 minute laat wees. As dit teen 27 km/h ry, sal hy 39 minute laat wees. Wat is die afstand tussen Springs en Soweto in kilometers?

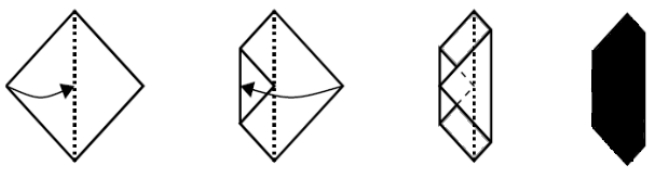
(**A**) 54 (**B**) 64 (**C**) 48 (**D**) 36 (**E**) 60

Question 20

A square-shaped piece of paper is folded twice as shown below. The area of the original square is $64\,cm^2$. What is the total area of the new six-sided shape?

Vraag 20

A vierkantige papier word twee keer gevou soos gewys hieronder. Die oorspronklike vierkant het 'n oppervlak van $64\,cm^2$. Wat is the oppervlakte van die nuwe ses-sydige figuur?



(**A**) $32cm^2$ (**B**) $34cm^2$ (**C**) $36cm^2$ (**D**) $38cm^2$ (**E**) none of these/geen van die