

MATHEMATICS CHALLENGE 2006

GRADE 8

DATE: WEDNESDAY 23 AUGUST 2006
DURATION: 90 MINUTES

GENERAL INFORMATION

1. Congratulations on being selected to participate in this challenge.
2. This examination paper consists of 20 questions.
3. Enter your final answer in the correct block on the ANSWER SHEET. Working details are not required.
4. Candidates that qualify to the SECOND ROUND will be required to show full working details.
5. Each question is worth 1 point. No marks are deducted for incorrect answers.
6. Calculators or other computing devices are NOT allowed.
7. Some questions have blanks. You are expected to fill in the blanks.
8. For multiple choice questions, write only the LETTER of your choice.
9. Please do not turn over until the invigilator gives you the signal

1. $2\frac{1}{9} - 1\frac{2}{3} = \dots\dots\dots$

2. Tembi adds 3 fractions.

She finds that their lowest common denominator is 300.



The set of possible denominators of these fractions is:

- A. 25; 75; 150
- B. 50; 75; 150
- C. 25; 50; 150
- D. 25; 75; 100

3. Simplify : $\frac{\sqrt[3]{64}}{16}$

4. * is a secret rule to combine two numbers.

If $3 * 6 = 14$
 $5 * 7 = 31$
 $12 * 4 = 44$

then what is the value of



$37 * 2?$

5. You may replace the * and # with + ; - ; × or ÷.

If $12 * 4 \# 8 = 11$, then

* = _____ and

= _____

6. $\frac{2416 \times 7 + 6 \times 2416}{26} = \dots\dots\dots$

7. What is the difference between the supplement of 63° and the complement of 41° ?

8. The angles of a triangle are in the ratio 2:3:5.

Find the largest angle.

9. If $a = 0,1$; $b = 2,2$ and $c = 0,022$, then find the value of

$\frac{ab}{2c}$.

10. Jason had 46 marbles.

He played a game and lost 13 but won 30.

He kept 12 for himself and

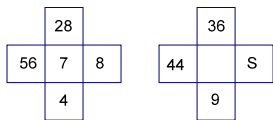


shared the rest equally amongst Paul, Sue and Sihle.

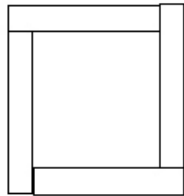
How many marbles did Sihle get?

11. The figure shows two division crosses that work in exactly the same way.

What is the value of S in the second cross?



12. Four strips of paneling each



36cm long and 6cm wide are arranged to form a square.

What is the area of the inner square in cm^2 ?

13. The average of a list of 10 numbers is 0.



Two more numbers, 40 and -4 , are added to these.

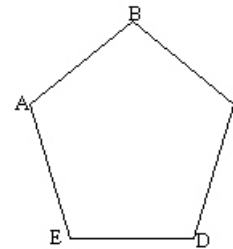
What is the new average?

14. $n! = 1 \times 2 \times 3 \times \dots \times n$

e.g. $5! = 1 \times 2 \times 3 \times 4 \times 5$,

What is the value of $\frac{10!}{2! \times 8!}$?

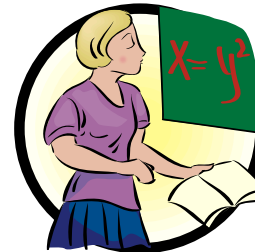
15. ABCDE is a regular pentagon (i.e all sides and angles are equal.)



What is the size of $\angle A$?

16. Given $3^x \cdot 3^y \cdot 3^z = 3^6 \cdot 3^{12}$.

What is the average of x , y and z ?



17. How many 2-digit numbers are exactly four times the sum of their digits?

18. Each of the following numbers can be written as the sum of 3 consecutive numbers:

$$9 = 2 + 3 + 4$$

$$36 = 11 + 12 + 13$$

$$48 = 15 + 16 + 17$$

Now write 252 in this way.

19. What is the difference between the sum of the first 100 positive even integers and the first 100 positive odd integers?



20. The natural numbers are arranged in a triangular grid shown below: What is the 3rd number in the 101st row?

