



2020 Wits Mathematics Competition

Final Round

Grade 4-5

Name:

School:

Instructions

This paper is 90 minutes long and consists of ten single answer questions (to be answered in the below table) and two proofs (to be answered on the pages they're written on). If needed, additional sheets of blank paper may be used to finish your solutions. Geometric equipment and language dictionaries are allowed but calculators and other computing devices are not.

"The really unusual day would be one where nothing unusual happens." — Persi Diaconis

SHARP

Question	Answer
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

A. Single Answer Questions

2 Marks

1. A word list contains 1034 words, with 42 words per page. How many pages are needed for the list?
2. 3 Boys plant 10 plants in 10 minutes. How many boys plant 60 plants in 60 minutes, working at the same rate?
3. Stefan starts walking from point A on the map following the road towards B . Thandi starts walking at the same time from B towards A . Stefan can walk $4km$ in one hour and Thandi can walk $3km$ in one hour. If the road is $21km$ long, after how many minutes will they meet?

3 Marks

4. Jackie has four cards numbered 1, 2, 3 and 4 shown below. How many different two-digit numbers can she make with these cards?

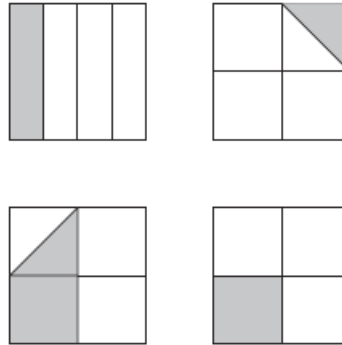
1

2

3

4

5. Each of the following four large identical squares is divided into combinations of identical triangles or rectangles and part of them are shaded. What percent of the total area is shaded?



6. The sum of the digits of a two-digit number is 11. If the digits were reversed, the number would be 45 less than itself. What is the two-digit number?
7. If the 3rd of April is a Saturday, then what day of the week will 8th September be in the same year?

4 Marks

8. An arrow is formed in a square by joining the bottom corners to the midpoint of the top edge and the centre of the square.



Calculate the area of the arrow.

9. Determine the missing value

2	3	13
6	4	52
7	?	130

10. Vusi, Thandi and Michael went to buy some snacks. The table shows what they bought and how much it cost. How much did one chocolate cost?

	Chocolate	Chips	Juice	Price
Vusi	0	2	2	R28
Thandi	1	1	1	R22
Michael	2	2	0	R26

B. Proof Questions

11. An autobiographical number is a number whose first digit is the number of zeros in the number, whose second digit is the number of ones, and so on. For example 1210 is autobiographical because it has 1 zero, 2 ones, 1 two and 0 threes. It just so happens that there is exactly one 10 digit autobiographical number. Find it and explain your working.

12. How many two - digit numbers do not have 2 and 3 as factors?