

MATHEMATICS TEAM CHALLENGE 2016

TEAM EVENT: Junior (year 7 & 8)

Time: 45 minutes

(Calculators are allowed)

Total: 150 points

Please write answers on the answer sheet.

T1. (10 points)

What is my address?

It is a 3-digit number.

The sum of the 3-digits totals 13.

The number is odd.

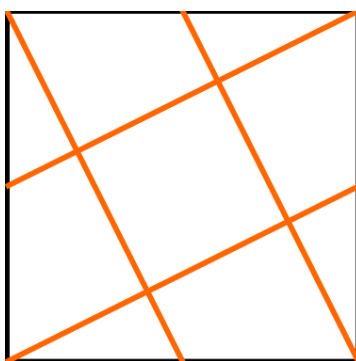
My address is the sum of two square numbers.

Two of the digits are also square numbers.

Doubling one of the three digits results in one of the other two digits.

T2. (20 points)

What is the area of the square in the middle of the diagram below? The outer square has a 1 metre side length.



1 metre

T3. (20 points)

For each of the numbers 462, 851, and 211, the hundreds digit is greater than the units digit. How many 3-digit numbers have this property?

T4. (10 points)

The first few terms of the Fibonacci sequence are listed below.

1, 1, 2, 3, 5, 8, 13, 21,

The next term in the sequence is formed by adding the previous two terms.

Suppose "N" consecutive Fibonacci terms are added until the sum is divisible by 11. What is the smallest value for N?

T5. (15 points)

Matt rolls a standard blue 6 sided die and a red die. What is the probability that the number showing on the blue die is less than the number on the red die?

T6. (20 points)

Radio station FM 94.9 started playing their full catalogue of 10,800 songs on the 1st January, 2016. This catalogue was known as the 'A to Z'. On average a song takes 3 minutes and there is a 1 minute break between songs. If the first song started playing at 10:15 am on the 1st of January 2016, on what date and time did the last song finish?

T7. (10 points)

A soccer team earns 3 points for a win and 1 point for a draw. After 20 matches the team has a total of 28 points. If the number of draws equals the sum of the number of wins plus the number of losses, how many wins did the soccer team achieve?

T8. (15 points)

Marsha tries to sort a pile of coins into 3 equal groups, but there is 1 coin left over. She then tries to sort the coins into 4 equal groups, but there is 1 coin left over again. Next she tries to sort the coins into 5 equal groups, but there is still 1 coin left over. What is the least number of coins in Marsha's pile?

T9. (15 points)

Express the following in lowest terms.

$$\frac{1 + 2 + 3 + 4 + \dots + 98 + 99 + 100}{1 + 2 + 3 + 4 + \dots + 98 + 99 + 100 + 101}$$

T10. (15 points)

You start with \$1,000 and bet half of your stake with each bet. Suppose you have a 50-50 chance of winning or losing and bet 7 times. How much money will you have in the end if you win exactly 3 times? [Round your answer to the nearest whole dollar]