INTERHOUSE MATHEMATICS TEAM

CHALLENGE 2023

# YEARS 9-10 TEAM EVENT Time: 30 minutes

**(*Calculators are allowed)* Total: 100 points\_**

***Please write answers on the answer sheet.***

**T1. (20 points)**

What is the only 4-digit perfect square that consists of two 2-digit squares written side by side?

**T2. (20 points)**

The six-square arrangement below can be folded and made into a cube. How many other six-square arrangements are possible that could be folded into cubes?

 

**T3. (10 points)**

Find another pair of two-digit numbers which when squared and added together sum to 845.

One example is: $22^{2}+ 19^{2}=845$

**T4. (10 points)**

At a Christmas family gathering, there was 1 grandmother, 1 grandfather, 2 fathers, 2 mothers, 3 grandchildren, 1 sister, 2 brothers, 1 father-in-law, 1 mother-in-law and 1 son-in-law. What is the smallest number of people present at the Christmas?

**T5. (20 points)**

Twenty-five lines are drawn in such a way so that no two are parallel and no three pass through the same point. This results in 326 regions, some closed (bounded on all sides) and some open. How many closed regions occur? For example, with three lines, there are 6 unbounded regions and one closed region shown shaded.

 

**T6. (20 points)**

A gram of DNA can theoretically hold 455 exabytes of data. ($455 ×10^{18}$)

One CD can hold 650 megabytes of data. (650 $×10^{6}$) and is approximately 1.2 mm thick.

How high would a stack of CDs be if the DNA data was stored solely on CDs?

Answer in kilometres.

### **2023 INTERHOUSE MATHS TEAM CHALLENGE**

#### **YEARS 9-10 TEAM EVENT**

RESPONSE SHEET

|  |  |  |
| --- | --- | --- |
| Question | Answers | Points |
| **T1.** (20 points) |  |  |
| **T2.** (20 points) |  |  |
| **T3.** (10 points) |  |  |
| **T4.** (10 points) |  |  |
| **T5.** (20 points) | \_\_\_\_ |  |
| **T6.** (20 points) |  |  |

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| --- | --- |
| House | Total Score |

### **2023 INTERHOUSE MATHS TEAM CHALLENGE**

#### **INTERMEDIATE (Year 9 & 10)**

TEAM EVENT

**ANSWER SHEET**

|  |  |  |
| --- | --- | --- |
| Question | Answers | Points |
| **T1.** (20 points) | 1681 |  |
| **T2.** (20 points) | 10 |  |
| **T3.** (10 points) | $$13^{2}+ 26^{2}=845$$ |  |
| **T4.** (10 points) | 7 |  |
| **T5.** (20 points) | 276 |  |
| **T6.** (20 points) | 840000 km |  |