Team # _____

Question 1:

In the diagram, points R and S lie on QT. Also, ⊰PTQ = 62º, ⊰ RPS = 34º, and ⊰QPR = xº. What is the value of x?
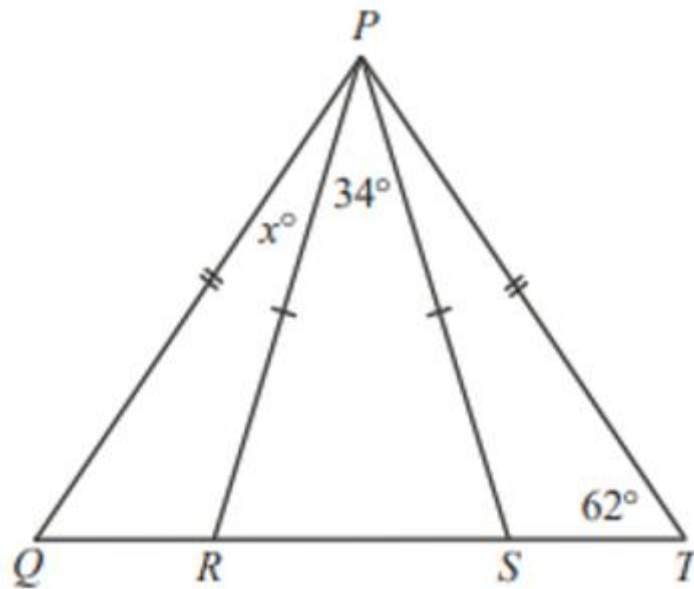
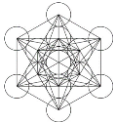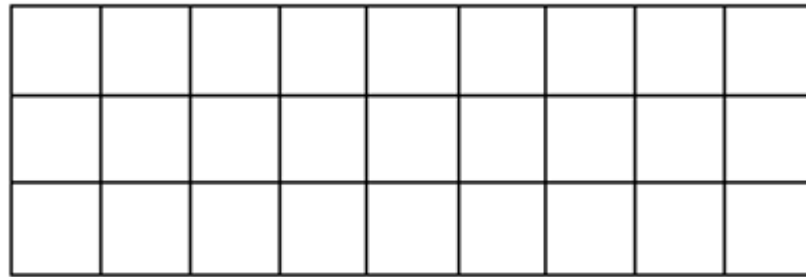| 5	3	2	1

Team # _____

Question 2:

Yani pasted some stickers in the 3 by 9 grid below such that each small square of the grid either had a sticker or had a common side with a square which had a sticker. What was the least number of stickers Yani pasted inside the grid?
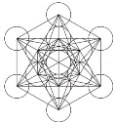
5	3	2	1

Team # _____

Question 3:

The table below shows the number of different colour beads that Mary has.
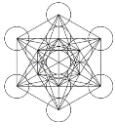
The total number of orange and blue beads is 5/7 of the total number of red, yellow, and pink. The total number of purple and orange beads makes up ¼ of all the total beads that Mary has. How many purple beads does Mary have?

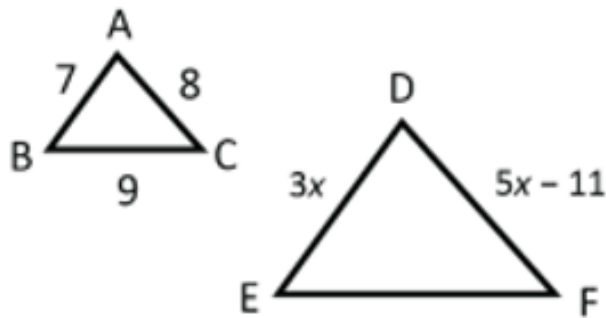| Colour	Number
Red	26
Yellow	12
Pink	18
Purple	?
Orange	?
Blue	25

5	3	2	1

Team # _____

Question 4:

If triangles ABC and DEF are similar (sides have same ratio), what is the value of x?

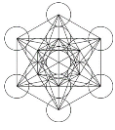| 5	3	2	1

Team # _____

Question 5:

Fifty students were surveyed about their participation in hockey and baseball. The results of the survey were:

33 students played hockey

24 students played baseball

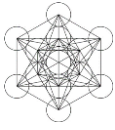8 students played neither hockey nor baseball

How many of the students surveyed played both hockey and baseball?

5	3	2	1

Team # _____

Question 6:

The statements below give the clues to identifying a secret four-digit number, N.

2 7 4 1 A digit is correct, but it's in the wrong place.
4 1 3 2 Two digits are correct, but they are in the wrong place.
7 6 4 2 None of the digits are correct.
9 8 2 6 One digit is correct and it's in the correct place.
5 0 7 9 Two digits are correct, one is in the correct place and the other is in the wrong place.
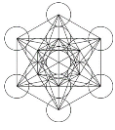
What is the digit in the hundreds column of the number N?

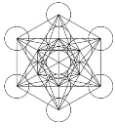| 5	3	2	1

Team # _____

Question 7:

If $(ax + 2)(bx + 7) = 15x^2 + cx + 14$ for all values of x, and $a + b = 8$, what is the largest value of the two possible values for c?

5	3	2	1

Team # _____

Question 8:

There are some red and blue balls in a box. If 23 red balls were removed, the ratio of the number of red balls to that of the ball balls would be 1:2. If 80 blue balls were removed instead from the original number of balls in the box, the ratio would become 5:1. How many red balls are in the box originally?

5	3	2	1
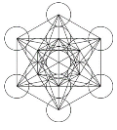
Team # _____

Question 9:

The figure below shows a metal bar which is 4 cm high, 4 cm wide, 1 cm thick and 12 cm long. What is the volume of the bar?

5	3	2	1

Team Round

Team # _____
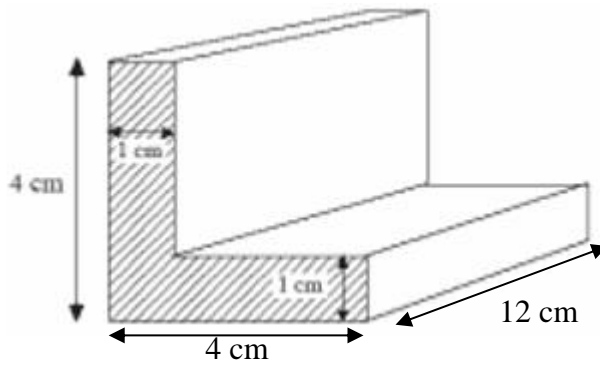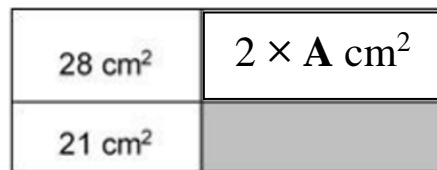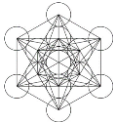
Relay 1:

1. A line is represented by the table of values to the right.
   The point (12, **A**) is on this line.

 | x | y |
   |---|---|
   | 1 | 1.5 |
   | 2 | 3 |
   | 3 | 4.5 |
   | 4 | 6 |

   Write the value of **A** in the box #1 of the Relay Answer Sheet.

2. A rectangle is divided into 4 parts as shown in the diagram with the areas shown. **B** is the area of the shaded part.

28 cm²	$2 \times$ **A** cm²
21 cm²	

   Write the value of **B** in Box # 2 of the Relay Answer Sheet.

3. The number in each circle is the sum of the numbers in the two circles immediately below the circle. Find **C** the value at the top circle.
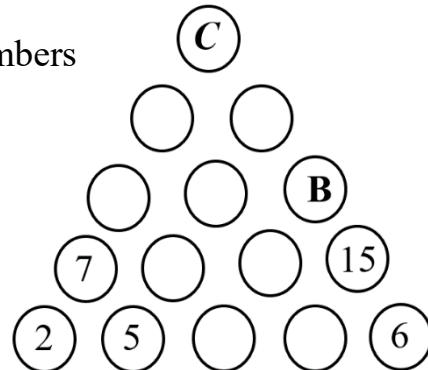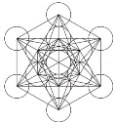

   Write the value of **C** in Box # 3 of the Relay Answer Sheet.

4. Some identical glasses are stacked on top of each other. A stack of eight glasses is **C**/2 cm high. A stack with two glasses is 17 cm. **D** is the height of six stacked glasses.

   Write the value of **D** in Box # 4 of the Relay Answer Sheet.

5	3	2	1

Team # _____

Relay 2:

1. Alan, Bob, and Guy have a total of $30 between them. Alan has 6 dollars less than Bob. Bob has four times as much money as Guy. **A** is how much does Guy has.
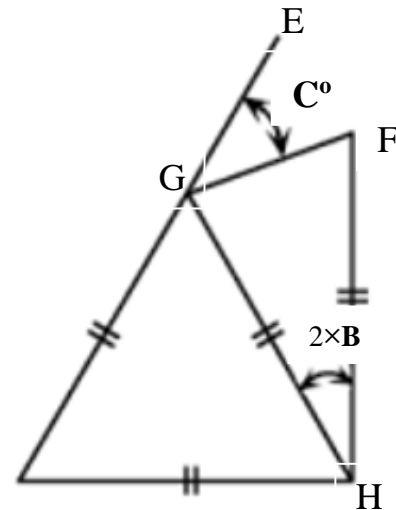
    Write the value of **A** in Box # 1 of the Relay Answer Sheet.

2. The function $g(x) = \mathbf{a}x^2 + 24$ has a leading coefficient, **a** when $g(\mathbf{A}) = 8$. **B** $= g(-3)$.

    Write the value of **B** in Box # 2 of the Relay Answer Sheet.

3. $\angle GHI = 2 \times \mathbf{B}.$ **C** is the measure of $\angle FGE$.

    Write the value of **C** in Box # 3 of the Relay Answer Sheet.
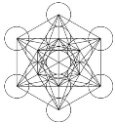

4.
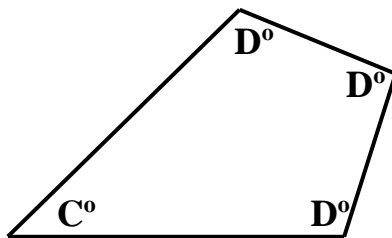
    In this quadrilateral, **C**º is one measure and the other 3 angles are the same measure, **D**º.

    Write the value of **D** in Box # 4 of the Relay Answer Sheet.

5	3	2	1

Team # _____

Relay 3:

1.   **A** is the number of different two-digit numbers where both digits are even.

   Write the value of **A** in Box # 1 of the Relay Answer Sheet.

2. $\sqrt{A + 16} - B = 0$. Find **B**.

   Write the value of **B** in Box # 2 of the Relay Answer Sheet.

3.   If $\frac{a}{b} = B - 3, then\ C = \frac{15b}{a}$

   Write the value of **C** in Box # 3 of the Relay Answer Sheet.

4.   In a game between 4 teams, Team K scored 7×**C** points. Team J scored
   5 less than team L. Team M scored 2 more than Team L. Team M also
   scored 15 less than Team K. **D** is the number of points Team J scored.

   Write the value of **D** in Box # 4 of the Relay Answer Sheet.
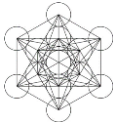
5	3	2	1

Team # _____

Relay # 1 - Answers

A	**18**
B	**27**
C	**82**
D	**33**

Relay # 1 - Answer Sheet

TEAM #_____ School: _____

A	
B	
C	
D	

Regular points (max. 5)   +   Bonus Points (max. 6)   =   Total Points

Proctors Initials: _____

5	3	2	1

Team # _____

Relay # 2 - Answers

A	4
B	15
C	45
D	105

Relay # 2 - Answer Sheet

TEAM #_____ School: _____

A	
B	
C	
D	

Regular points (max. 5)   +   Bonus Points (max. 10)   =   Total Points

Proctors Initials: _____

5	3	2	1

Team # _____

Relay # 3 - Answers

A	**20**
B	**6**
C	**5**
D	**13**

Relay # 3 - Answer Sheet

TEAM #_____   School: _____

A	
B	
C	
D	

Regular points (max. 5)   +   Bonus Points (max. 10)   =   Total Points

Proctors Initials: _____
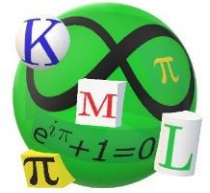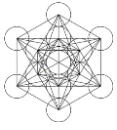
5	3	2	1

Team # _____

Answers
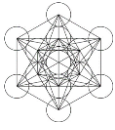
1. **11** /

2. **7 stickers** /

3. **12 purple beads** /

4. **X = 7** /

5. **15 students** /

6. **0** /

7. **41** /

8. **70** /

9. **84** /

5	3	2	1

2 | **7 stickers**

3 | Total number of red, yellow and pink beads is 56.

Total number of orange and blue beads is $\frac{5}{7}$ × 56 = 40

Mary has 40 – 25 = 15 orange beads.

26 + 12 + 18 + 25 = 81

$\frac{3}{4}$ of total number of beads = 81

$\frac{1}{4}$ of total number of beads = 81 ÷ 3 = 27 (number of purple and orange beads)

27 – 15 = 12

Mary has <u>12</u> purple beads.

5 | *Solution 1*

Since there were 50 students surveyed in total and 8 played neither hockey nor baseball, then 42 students in total played one game or the other.

Since 33 students played hockey and 24 students played baseball, and this totals $33 + 24 = 57$ students, then there must be 15 students who are "double-counted", that is who play both sports.

Solution 2

Let x be the number of students who play both hockey and baseball.

Then the number of students who play just hockey is $33 - x$ and the number of students who play just baseball is $24 - x$.

But the total number of students (which is 50) is the sum of the numbers of students who play neither sport, who play just hockey, who play just baseball, and who play both sports.

In other words,

$$\begin{aligned} 8 + (33 - x) + (24 - x) + x &= 50 \\ 65 - 2x + x &= 50 \\ 65 - x &= 50 \\ 65 - 50 &= x \\ x &= 15 \end{aligned}$$

Therefore, the number of students who play both sports is 15.

ANSWER: (D)

5	3	2	1

6.   Answer = 0   N = 3019

8.   22.
                                      red : blue
         After 23 red balls removed: 1 : 2   Total → 3x + 23
         After 80 blue balls removed: 5 : 1   Total → 6y + 80

         3x + 23 = 6y + 80
         3x = 6y + 57
         x = 2y + 19

         x + 23 = 5y
         2y + 19 + 23 = 5y
         3y = 42
         y = 14
         5y = 14 × 5 = <u>70 red balls</u> in the box.

5	3	2	1