Relay #1 – Seat 1a

If $x = 1$ and $y = 630$, what is the value of $2019x - 3y - 9$?

Relay #1 – Seat 1b

Let t be TNYWR.

At the start of 2018, the Canadian Excellent Mathematics Corporation had t employees in its Moose Jaw office, 40 employees in its Okotoks office, and no other employees. During 2018, the number of employees in the Moose Jaw office increased by 25% and the number of employees in the Okotoks office decreased by 35%. How many additional employees did the CEMC have at the end of 2018 compared to the beginning of 2018?

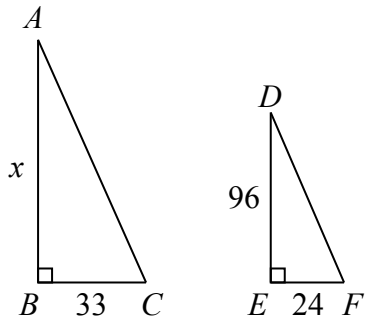
Relay #1 – Seat 1c

Let t be TNYWR.

Kolapo lists the four-digit positive integers that can be made using the digits 2, 4, 5, and 9, each once. Kolapo lists these integers in increasing order. What is the t^{th} number in his list?

Relay #2 – Seat 1a

In the diagram, $\triangle ABC$ is similar to $\triangle DEF$. What is the value of x?



Relay #2 – Seat 1b

Let t be TNYWR.
The sum of the even integers from 2 to $2k$ inclusive equals t for some positive integer k.
That is,

$$2 + 4 + 6 + \cdots + (2k - 2) + 2k = t$$

What is the value of k?

Relay #2 – Seat 1c

Let t be TNYWR.
Suppose that O is the origin. Points $P(a, b)$ and $Q(c, 1)$ are in the first quadrant with $a = 2c$.
If the slope of OP is t and the slope of OQ is 1, what is the slope of PQ?

Relay #3 – Seat 1a

How many perfect squares are there between 2 and 150?

Relay #3 – Seat 1b

Let t be TNYWR.
The line with equation $y = -2x + t$ and the parabola with equation $y = (x-1)^2 + 1$ intersect at point P in the first quadrant. What is the y-coordinate of P?

Relay #3 – Seat 1c

Let t be TNYWR.
The triangle in the first quadrant formed by the x-axis, the y-axis, and the line with equation $(k-1)x + (k+1)y = t$ has area 10. What is the value of k?