

Math Field Day 2014
Relay A

A1. Find the slope of the line through the points $(-2, -7)$ and $(2, 1)$.

A2. Let k be the number you receive. Find the base of a rectangle whose perimeter is 20 and whose height is k more than its base.

A3. Let k be the number you receive. Find the x -intercept of the line of slope 2 through the point $(4, k)$.

A4. Let k be the number you receive. Evaluate

$$\frac{1 + \frac{1}{k}}{1 - \frac{1}{k^2}}$$

A5. Let k be the number you receive. Find the y -intercept of the line that contains the point (k, k^2) and is perpendicular to the line through that point and the origin.

1. 2

2. 4

3. 2

4. 2

5.

Math Field Day 2014
Relay B

B1. If the difference of two positive numbers is 5 and the difference of their squares 45, find their sum.

B2. Let k be the number you receive. Find the x -coordinate of the point where the lines $2x + y = 0$ and $x - y = k$ intersect.

B3. Let k be the number you receive. Evaluate $1 + \frac{2}{1 - \frac{1}{k}}$

B4. Let k be the number you receive. Find the larger of the two x -intercepts of the parabola $y = k - (x - 2)^2$.

B5. Let k be the number you receive. Find the area of a square with diagonal of length k .

1. 9

2. 3

3. 4

4. 4

5.

8

Math Field Day 2014
Relay C

- C1. How many prime numbers are less than 20?
- C2. Let k be the number you receive. Find the smaller of the two roots of the quadratic $2x^2 - 3kx + k^2$.
- C3. Let k be the number you receive. Let $f(x) = x^2 + kx$ for all x .
Solve for x : $f(x+1) = f(x) + 11$.
- C4. Let k be the number you receive. Find the length of the hypotenuse of a right triangle with legs of lengths $k^2 - 1$ and $2k$.
- C5. Let k be the number you receive. When a tree of height 35 ft. casts a shadow of length k ft., how many feet tall is a tree that casts a shadow of length $k + 8$ ft.?

1. 8

2. 4

3. 3

4. 10

5.

Relay D

D1. How many positive integers less than 25 are multiples of 3 or 4 or both?

D2. Let k be the number you receive. If $8^x = 4^{k+3}$, find x .

D3. Let h be the number you receive from the front, and let k be the number you receive from the back. Find x if

$$\frac{1}{h+k} + \frac{1}{k} = \frac{x}{h+k}$$

D4. Let k be the number you receive. Find the larger of the two roots of $kx^2 - (k^2 + 1)x + k$

D5. Let $a_1 = 0$ and $a_2 = 1$. If $a_n = 2a_{n-1} - a_{n-2}$ for $n \geq 3$, find a_6

1. 12

2. 10

3.

4. 5

5. 5