Relay A

A1. Find the slope of the line with equation $6x - 2y = 3.$.

A2. Let k be the number you receive. Find the sum of the positive integer factors of $2k$, including 1 and $2k$.

A3. Let k be the number you receive. Find the y coordinate of the point of intersection of the lines with equations $x + 3y = 6k$ and $x - y = 2k$.

A4. Let k be the number you receive. Lines from the center of a regular polygon to the vertices divide the polygon into k congruent triangles. What number is the degree measure of the smallest angle of each triangle?

A5. Let k be the number you receive. Find the largest solution of the equation $x^2 - 7x = k$.

1. 3 2. 12 3. 12 4. 30 5. (10)

Relay B

B1. Find the degree of the polynomial $\left(\frac{1}{2}x-2\right)^2\cdot(2x+3)^4$.

B2. Let k be the number you receive. What negative number satisfies the equation $x^2-kx=16$?

B3. Let k be the number you receive. How many positive prime numbers are less than $10-k$? (Remember that 1 is NOT a prime.)

B4. Let k be the number you receive. Find the slope of the line with equation $3x+ky=k^2$.

B5. Let k be the number you receive. Find $\frac{3k-1}{k+1}$.

1. 6 2. -2 3. 5 4. -3/5 5. -7

MATH FIELD DAY 2005 RELAYS

Relay C

C1. Find the positive integer k such that $(k + 1)^2$ and k^2 differ by 13.

C2. Let k be the number you receive. Find the radius of the circle with circumference πk.

C3. Let k be the number you receive. Find the real root of $x^3 - 9k = 0$.

C4. Let k be the number you receive. Find the area of the right triangle with legs of lengths k and 6 and hypotenuse $\sqrt{36 + k^2}$.

C5. Let k be the number you receive. Find the number of distinct positive integer factors of k^2.

1. 6 2. 3 3. 3 4. 9 5. (5)

MATH FIELD DAY 2005 RELAYS

Relay D

D1. Find the solution of the equation $\frac{2^{x-1}}{8} = 4$.

D2. Let k be the number you receive. Find the solution of the equation $\frac{5x+3}{x-1} = k$.

D3. Let k and h be the numbers you receive. If k and h are the roots of the polynomial $x^2 + bx + c$, find b.

D4. Let h be the number you receive. Find the x-intercept of the line with equation $6x + 2y = h^2$.

D5. Find the smallest positive number *k* that has four different positive factors: 1, *k*, and two other integers.

1. 6 2. 9 3. (-15) 4. 6 5. 6