MATH FIELD DAY 2003 - Relay A

A1 *Given a right triangle with a hypotenuse of 3 and one leg of* $2\sqrt{2}$, *find the length of the other leg.*

A2 *Let k = the number you receive.*
Find the value of $\dfrac{1}{1+\dfrac{1}{1+\dfrac{1}{k}}}$

A3 *Let k = the number you receive.*
Solve for x: $2 = \dfrac{k(k+x)}{2}$

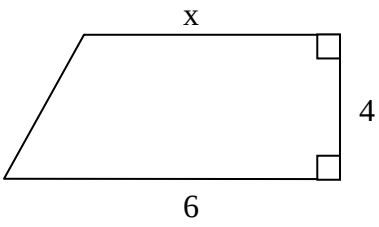
A4 *Let k = the number you receive.*
If f(x - 1) = 3x - 4, find f(k).

A5 *Let k = the number you receive.*
Find A if $p(x) = x^2 + kx + A$
and one zero of p(x) is 4 times the other.

1 *2/3* *16/3* *15* *36*

MATH FIELD DAY 2003 - Relay B

B1 *The top and bottom are perpendicular to the right edge. The figure has area 16. What is x?*



B2 *Let k = the number you receive. What is the remainder when $x^3 - x^2 + 4$ is divided by x - k?*

B3 *Let k = the number you receive. The line $y = -kx + k$ forms a triangle with the lines x = 0 and y = 0. What is the area of the triangle?*

B4 *Let k = the number you receive. How many quarts of water must be added to k quarts of antifreeze to give a solution that is 80% antifreeze?*

B5 *Let k = the number you receive. If $\tan \theta = k$, evaluate $\sin^2 \theta$.*

MATH FIELD DAY 2003 - Relay C

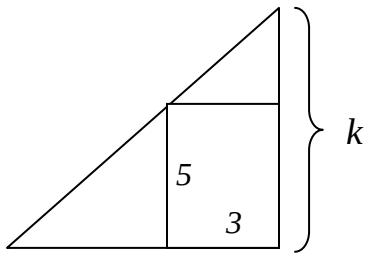
C1 *How many ways are there to choose two students to get A's out of a seminar with four students?*

C2 *Let k = the number you receive. If $2^k x = y$, $x^5 y = 8^k$, and $x = 2^r$, what is r?*

C3 *Let k = the number you receive. If $\left(k + \sqrt{2}\right)^3 = a + b\sqrt{2}$ for integers a and b, what is b?*

C4 *Let k = the number you receive. Find the y-coordinate of the vertex of the parabola $y = x^2 + kx + 55$.*

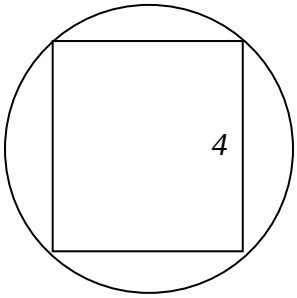
C5 *Let k = the number you receive. A rectangle of base 3 and height 5 is inscribed in a right triangle of height k. How long is the base of the triangle?*



6 *2* *14* *6* *18*

MATH FIELD DAY 2003 - Relay D

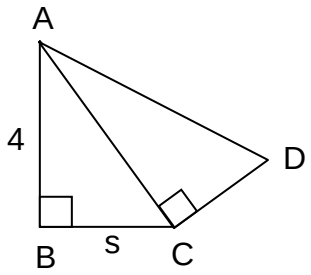
D1 *A rectangle of height 4 is inscribed in a circle of area 5π. How long is the base of the rectangle?*



D2 *Let k = the number you receive.*

If $x = k + \frac{2k^2}{x}$ *and x > 0, what is x?*

D3 *Let s = the number you receive from the person in front of you, and t = the number you receive from the person behind you. If ∠ABC = 90° = ∠ACD, BC = s, and CD = t, find AD.*



D4 *Let k = the number you receive. What is the radius of the circle* $x^2 + y^2 - 8y + k = 0$ *?*

D5 *How many ways are there to arrange the letters in MEMO?*

2	*4*	*6*	*2*	*12*