🇬🇧 TEST YOUR SKILLS

1 On a test, the average score for the girls in the class is 91, and the average score for the boys in the class is 85. If the average score for the class is 89, what fraction of the class are boys?
(USA *Rice University Mathematics Tournament,* 2005) $\left[\dfrac{1}{3}\right]$

2 Let r be the line with equation $y = 2x - 8$ and let P and Q be the points at which r crosses the x-axis and the y-axis, respectively. Find the area of the triangle OPQ, where O is the origin. [16]

3 **TEST** Mr. Reiter drives from home to work at an average speed of 45 mph. His average speed from work back home is 50 mph. What is his average speed for the round-trip from home to work and back?

⬛A 47.5 mph.   ⬛C $\dfrac{900}{18}$ mph.

⬛B $\dfrac{900}{19}$ mph.   ⬛D $\dfrac{900}{17}$ mph.

(USA *North Carolina State High School Mathematics Contest*, 1997)

4 **TEST** Given $ax+by=(a-b)^2$ and $ax-by=a^2-b^2$, determine the difference in x and y.

⬛A $3(a + b)$.   ⬛D $2(a - b)$.
⬛B $3(a - b)$.   ⬛E $(a - b)$.
⬛C $2(a + b)$.

(USA *North Carolina State High School Mathematics Contest*, 2003)

5 Find the equation of the line through the point of intersection of $x - 2y + 6 = 0$ and $3x + 10y - 2 = 0$, and which contains the point $\left(\dfrac{1}{4}\,;0\right)$.

(IR *Leaving Certificate Examination, Higher Level*, 1995)
$[4x + 12y - 1 = 0]$

6 The real numbers s, y, z, w satisfy:

$$\begin{cases} 2x + y + z + w = 1 \\ x + 3y + z + w = 2 \\ x + y + 4z + w = 3 \\ x + y + z + 5w = 25 \end{cases}$$

Find the value of w.

(USA *Catawba College NCCTM, Mathematics Contest,* 2005)

$\left[\dfrac{11}{2}\right]$

7 A dog and a cat together cost $ 25. If the dog had cost $ 5 more and the cat's price did not change, then the cat's price would have been a third of the total. How much did the dog cost?

(USA *Bay Area Math Meet, Bowl Sampler,* 1997)
[$ 15]

8 Solve the system and state your conclusion.

$$\begin{cases} x - 2y = 8 \\ 3x + 4y = 6 \end{cases}$$

(CAN *John Abbott College, Final Exam*, 2001)

$\left[\dfrac{22}{5}\,;-\dfrac{9}{5}\right]$

9 The sum of three numbers is 17. The first is 2 times the second. The third is 5 more than the second. What is the value of the largest of the three numbers?

(USA *Lehigh University: High School Math Contest,* 2005)
[8]

GLOSSARY

average: media	**to satisfy**: soddisfare
to change: cambiare	**score**: punteggio
to cross: attraversare	**to solve**: risolvere
to drive-drove-driven: guidare	**to state**: dichiarare, precisare
price: prezzo	**system**: sistema
round-trip: viaggio di andata e ritorno	