

TEST YOUR SKILLS

TEST

- 1** How many different real numbers satisfy the equation below?

$$(x^2 + 4x - 2)^2 = (5x^2 - 1)^2$$

A 0 **B** 1 **C** 2 **D** 3 **E** 4

(USA University of South Carolina: High School Math Contest, 2003)

- 2** If a e b are roots of $2\sqrt{2x+4} - 2 = x$, then $ab =$

A 0 **B** 4 **C** -12 **D** -4 **E** 12

(USA Tennessee Mathematics Teachers Association: 39th Annual Mathematics Contest, 1995)

- 3** Let $f(n) = n(n+1)$, where n is a natural number. Find a pair $(a; b)$ such that $2f(b) + 2 = f(a)$ and $a = b + 2$.

A (2; 0)
B (3; 1)
C (4; 2)
D (5; 3)
E (6; 4)

(USA Tennessee Mathematics Teachers Association: 39th Annual Mathematics Contest, 1995)

- 4** How many different real numbered pairs $(x; y)$ satisfy the system of two equations below?

$$\begin{cases} x + xy + y = -9 \\ x^2 + y^2 = 17 \end{cases}$$

A 6 **B** 4 **C** 3 **D** 2 **E** 0

(USA University of South Carolina: High School Math Contest, 2004)

- 5** Solve. Don't forget to check your answers!

a) $\sqrt[3]{x-1} = 2$

b) $7a - 2 = 2\sqrt{5a-9} + 5a$

(USA Tacoma Community College, Review for Test, 2001)

[a] $x = 9$; b) $a = 2 \vee a = 5$

- 6** **TEST** Two of the roots of the equation $2x^3 - 3x^2 + px + q = 0$ are 3 and -2. The third root is:

A $\frac{1}{2}$ **D** $\frac{1}{3}$
B $-\frac{5}{2}$ **E** 1
C -3

(USA North Carolina State High School Mathematics Contest, 2004)

- 7** **TEST** The hypotenuse of a right triangle has length $\sqrt{61}$ cm and the sum of the lengths of the legs is 11 cm. What is the area of this triangle?

A 13.5 cm² **D** 15.0 cm²
B 14.0 cm² **E** 15.5 cm²
C 14.5 cm²

(USA Indiana State Mathematics Contest, 2005)

- 8** The roots of the equation $x^2 + 4x - 5 = 0$ are also the roots of the equation

$$2x^3 + 9x^2 - 6x - 5 = 0.$$

What is the third root of the second equation?

(CAN Canadian Open Mathematics Challenge, 1996)

$$\left[-\frac{1}{2} \right]$$

GLOSSARY

to check: provare, controllare

equation: equazione

to forget-forgot-

forgotten: dimenticare

leg: lato (cateto)

length: lunghezza

numbered pair: coppia ordinata

root: radice, soluzione

to satisfy: soddisfare

to solve: risolvere