🇬🇧 TEST YOUR SKILLS
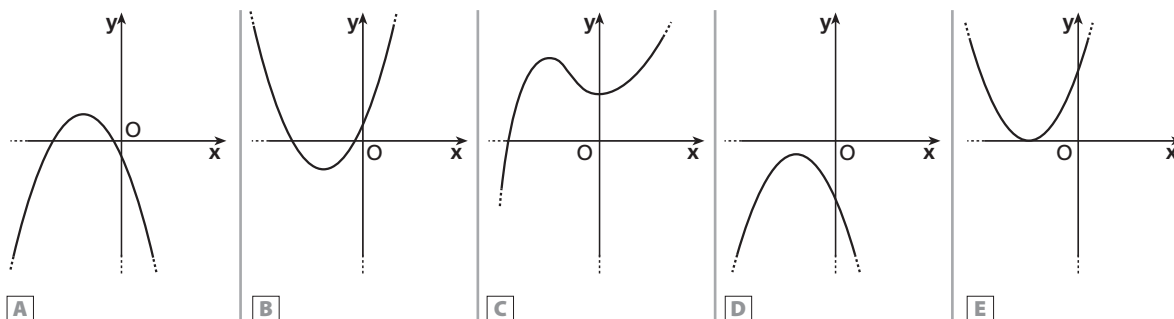
1 **TEST** If $ax^2 + bx + c = 0$ has no real roots, then $y = ax^2 + bx + c$ could have which graph?

| A | B | C | D | E |

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

2 Find the vertex of the parabola $x^2 + 2y = 2$.   (USA *Southern Illinois University Carbondale, Final Exam*, 2002)

$$[(0; 1)]$$

3 **TEST** Given that the vertex of the parabola $y = x^2 + 8x + k$ is on the x-axis, what is the value of k?

A 0   D 16

B 4   E 24

C 8

(USA *University of South Carolina: High School Math Contest*, 2001)

4 **TEST** The graph of two parabolas $y = 2x^2$ and $y = x^2 + x + 6$ intersect in two points. An equation for the line that passes through these two points is:

A $x - 2y + 18 = 0$.

B $2x - y - 18 = 0$.

C $2x - y + 12 = 0$.

D $2x - y + 4 = 0$.

E $x - 2y + 12 = 0$.

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

5 **TEST** Let $P(a; b)$ and $Q(c; d)$ denote two distinct points on the graph of $y = x^2$. Suppose that the slope of line PQ is 5 and the x coordinates of P and Q differ by 1. Find $b + d$.

A 41   D 5

B 25   E None of these.

C 13

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

6 A toy rocket is fired vertically from the ground. Its height in meters above the ground is given by $s(t) = 36t - 4.9t^2$, where t represents the time in seconds. What is the maximum height of the rocket?

(USA *Southeast Missouri State University: Math Field Day*, 2005)

$$[66.12 \text{ m}]$$

GLOSSARY

to denote: denotare	**ground**: suolo	**root**: radice, soluzione
to fire: sparare	**height**: altezza	**toy rocket**: razzo giocattolo
graph: grafico	**line**: retta	**vertex**: vertice