## 米 TEST YOUR SKILLS

1 Part of a graph is given below.


Sketch the rest of this graph if the graph has the indicate symmetry.
a) $y$-axis symmetry.
b) $x$-axis symmetry.
c) Origin symmetry.
d) Both $y$-axis and origin symmetry.
(USA Tacoma Community College, Worksheet)
2 TEST Which of the following functions is symmetric respect to the $y$-axis?
(A) $y=2 x$
(B) $y=x^{2}+2$
(C) $y=(x-2)^{2}$
(D) $y=(x+2)^{2}$
(因 $y=x^{2}+2 x$
(USA University of Wyoming, Practice Test, Finals)

3 TEST Starting with the point ( $3 ; 4$ ) in the cartesian plane, reflect it across the $x$-axis, then rotate it $180^{\circ}$ around the origin, and then finally translate it vertically by 5 units. The final point is:
A $(8 ;-4)$.
D ( $-4 ; 8$ ).
B $(3 ; 9)$.
E ( $-3 ; 9$ ).
C $(-3 ; 1)$.
(USA Marywood University Mathematics Contest, 2001)
4 TEST The point $(a ; b)$ is reflected over the $y$-axis to the point $(c ; d)$, which is reflected over the $x$-axis to the point $(e ; f)$. Compute $a b-e f$.
(A) 0 .
(D) 2cd.
(B) 2.
(E) $-2 c d$.
(C) $2 a b$.
(USA University of North Carolina: State Mathematics Finals Contest, 2003)

5 TEST Let $P$ be the point $(3 ; 2)$. Let $Q$ be the reflection of $P$ about the $x$-axis, let $R$ be the reflection of $Q$ about the line $y=-x$ and let $S$ be the reflection of $R$ through the origin. Then $P Q R S$ is a convex quadrilateral. What is the area of $P Q R S$ ?

| $A$ | 14 | B | 15 | C | 16 | D | 17 | E | 18 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

(USA North Carolina: State High School Mathematics Contest, 1997)
6 Suppose that a particle sitting at the point $(3 ; 6)$ is rotated $30^{\circ}$ in the clockwise direction about the point $(-1 ; 2)$. Give the coordinates of the new location of the particle.
(USA Texas A $\Leftarrow M$ University Math Contest, 1999)
$[(2 \sqrt{3}+1 ; 2 \sqrt{3})]$

GLOSSARY

| clockwise: | graph: grafico | to rotate: ruotare |
| :--- | :--- | :--- |
| in senso orario | to reflect: riflettere | to translate: traslare |

