TEST YOUR SKILLS

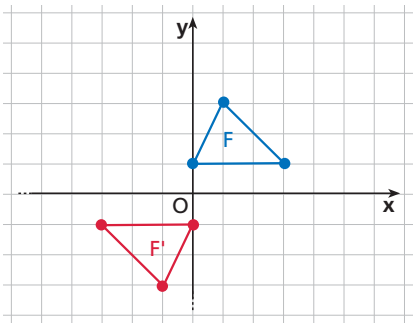
1 The point $(4; -2)$ is reflected in the x-axis. The resulting point is then reflected in the line with equation $y = x$. What are coordinates of the final point?

(CAN *Canadian Open Mathematics Challenge, COMC*, 2003)

[(2, 4)]

2 **TEST** In the figure below, which of the following is the mapping for the figure F and its image F'?

A $(x; y) \to (-x; y)$
B $(x; y) \to (x; -y)$
C $(x; y) \to (-x; -y)$
D $(x; y) \to (2x; y)$
E None of these answers.



(USA *Northern State University: 52nd Annual Mathematics Contest*, 2005)

3 If quadrilateral $DEFG$ $(D(-7; 4), E(-6; 6), F(-3; 7), G(-1; 3))$ is dilated with a scale factor of 2 using center of dilation $(-5; 9)$, give the coordinates of each of the vertices of the image $D'E'F'G'$.

(USA *University of Houston: High School Mathematics Contest*, 2005)

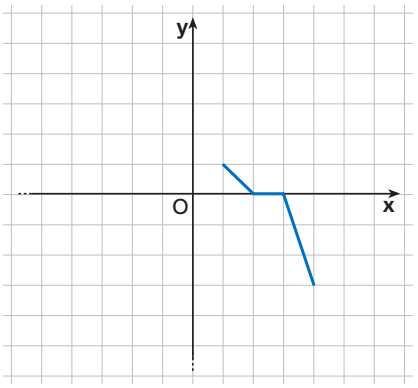
$[D'(-9; -1), E'(-7; 3), F'(-1; 5), G'(3; -3)]$

4 If quadrilateral $DEFG$ $(D(-7; 4), E(-6; 6), F(-3; 7), G(-1; 3))$ is rotated 90° counterclockwise with center of rotation $(-2; 1)$, give the coordinates of each of the vertices of the image $D'E'F'G'$.

(USA *University of Houston: High School Mathematics Contest*, 2005)

$[D'(-5; -4), E'(-7; 3), F'(-8; 0), G'(-4; 2)]$

5 **TEST** 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)

6 **TEST** Which of the following functions is symmetric respect to the y-axis?

A $y = 2x$
B $y = x^2 + 2$
C $y = (x - 2)^2$
D $y = (x + 2)^2$
E $y = x^2 + 2x$

(USA *University of Wyoming, Practice Test, Finals*)

7 Determine (algebraically) if each function is even, odd, or neither.

a) $y = |x + 2|$.
b) $y = |x| + 2$.
c) $y = x^2 + 3$.
d) $y = x^2 + 3x$.
e) $y = x^3 - 5x$.
f) $y = x^3 - 5$.

(USA *Tacoma Community College*, Worksheet)

[a) neither; b) even; c) even; d) neither; e) odd; f) neither]

GLOSSARY

algebraically: algebricamente
counterclockwise: in senso antiorario
even: pari
mapping: trasformazione
odd: dispari
scale factor: fattore di scala