

Transformations High School Mathematics Using Transformations

Richard Parr

rparr@rice.edu

Rice University School Mathematics Project

<http://rusmp.rice.edu>

CCSS.MATH.CONTENT.HSF.BF.B.3

Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

CCSS.MATH.CONTENT.HSG.CO.A.2

Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).

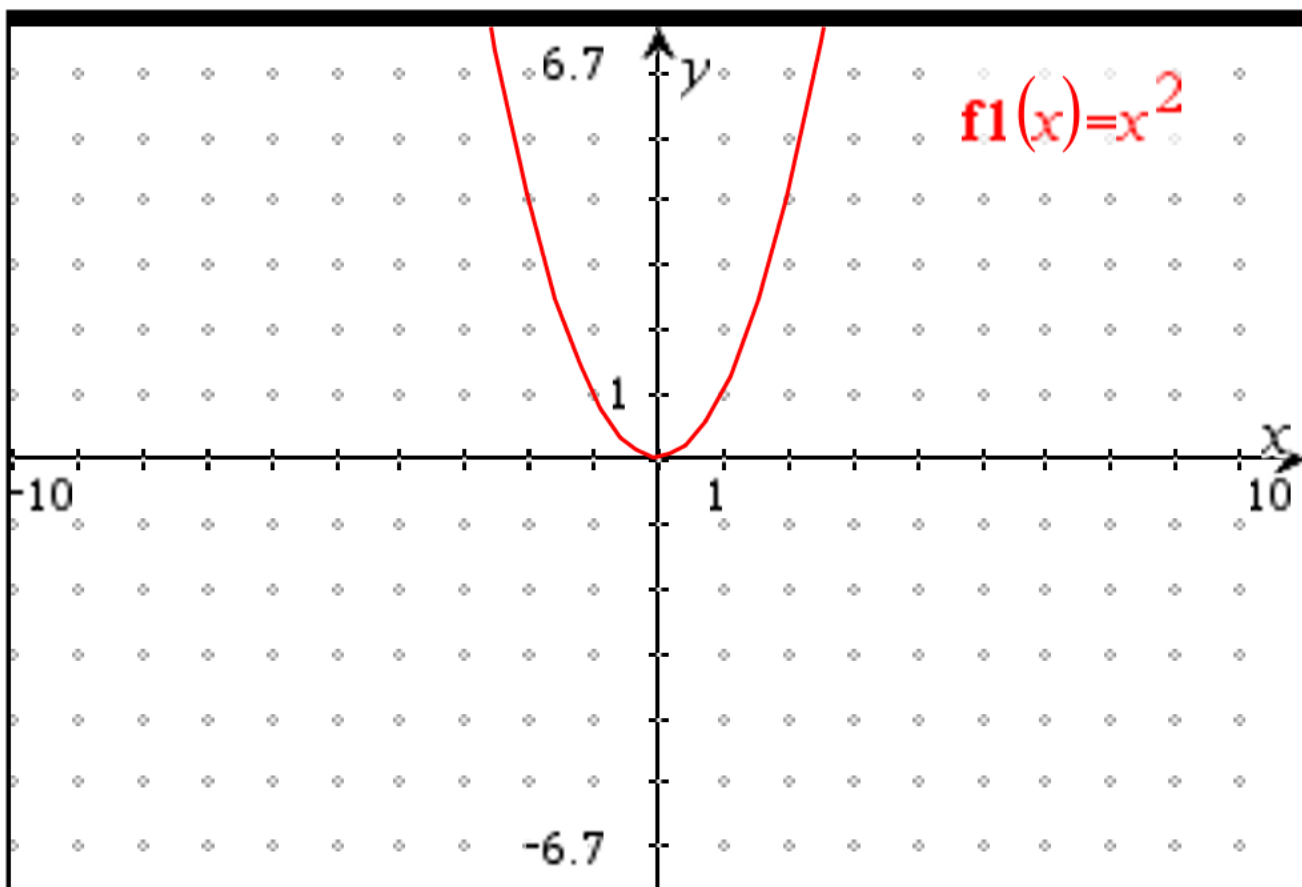
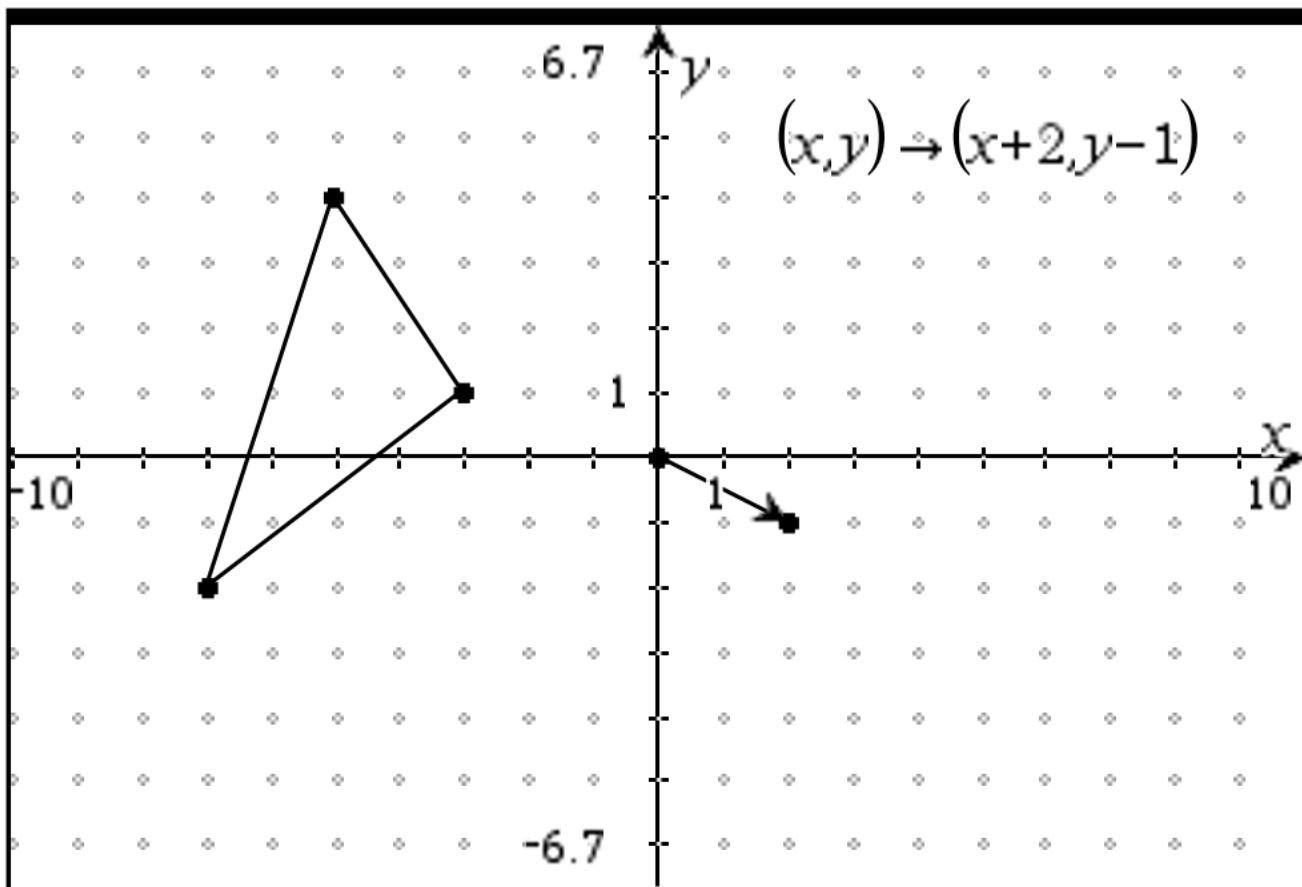
CCSS.MATH.CONTENT.HSG.CO.A.4

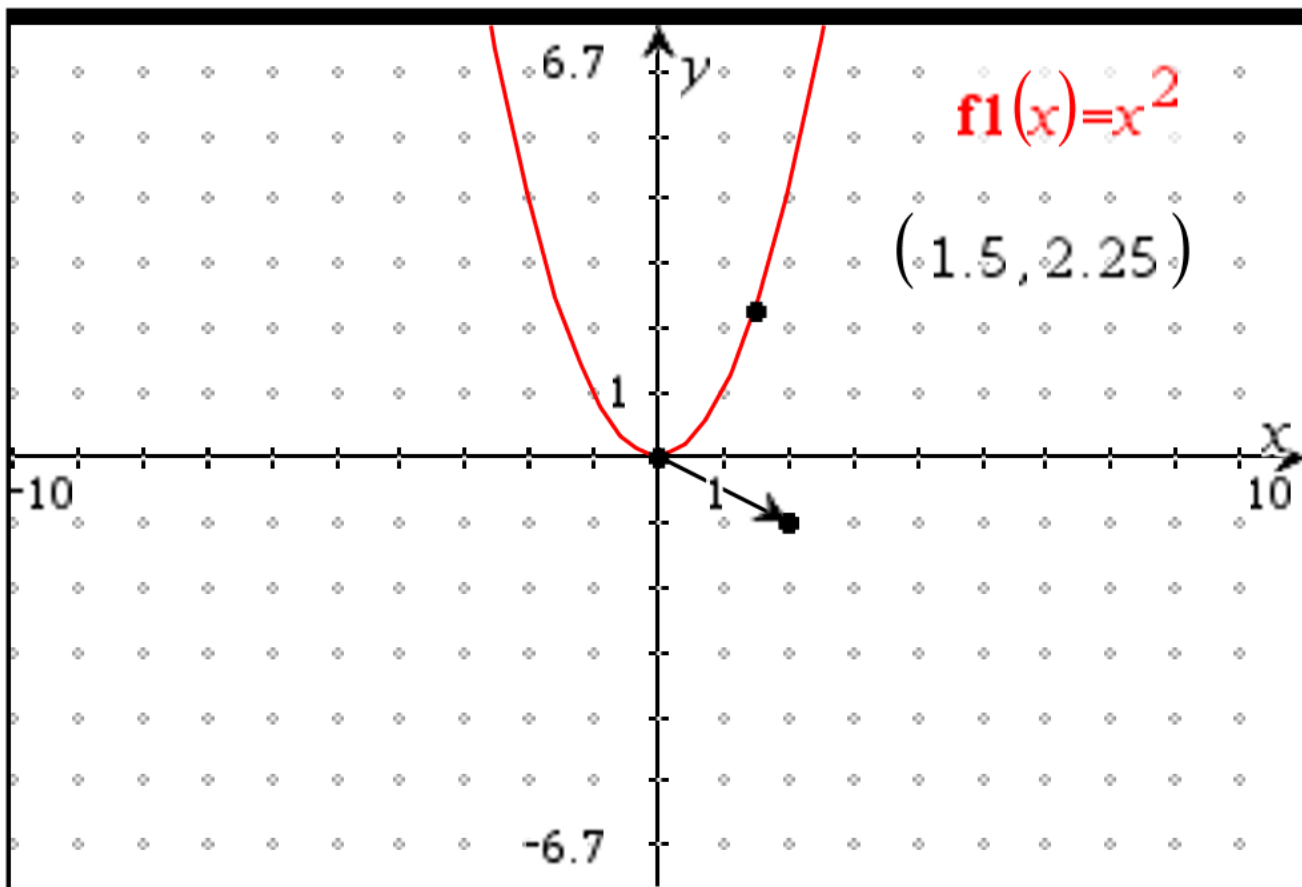
Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

CCSS.MATH.CONTENT.HSG.CO.A.5

Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

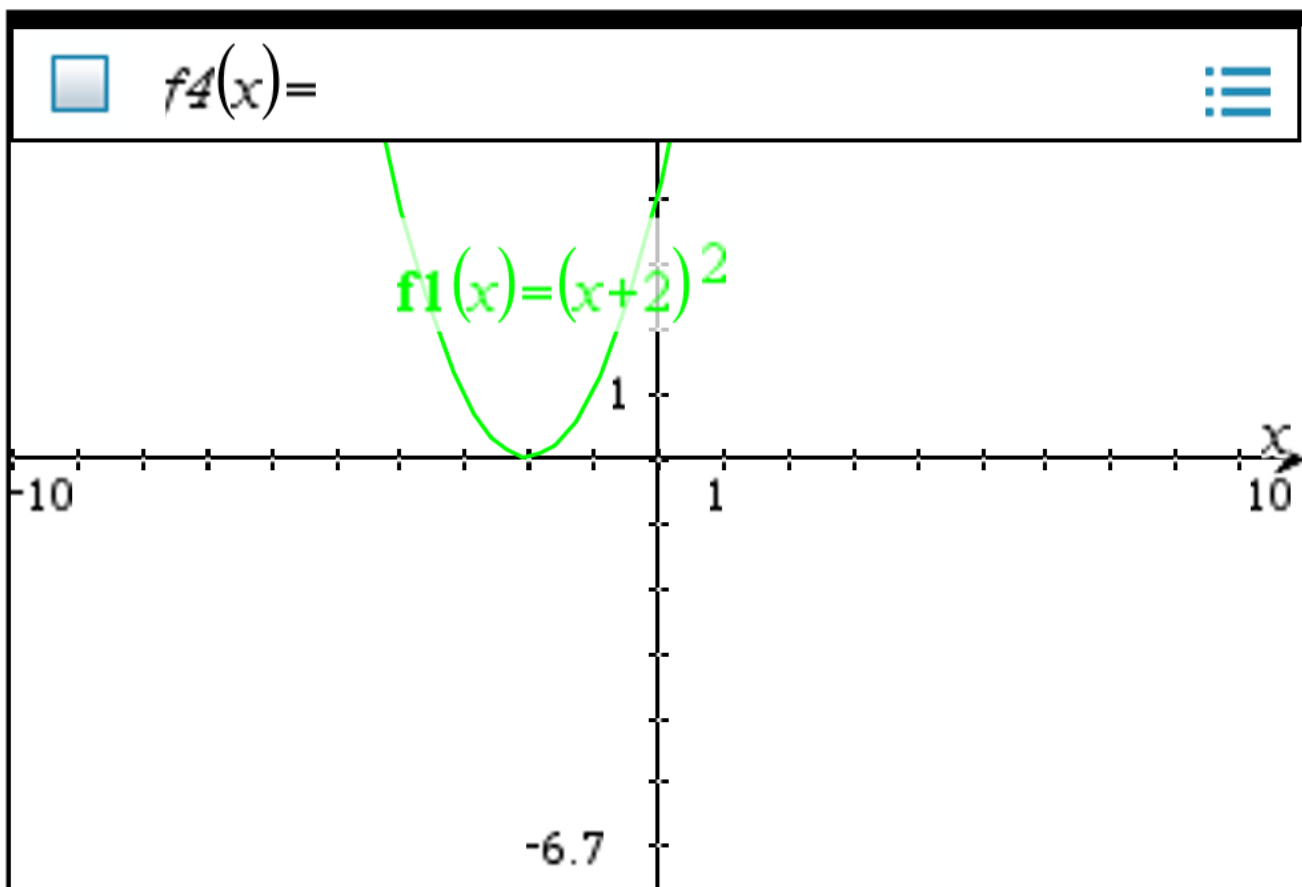
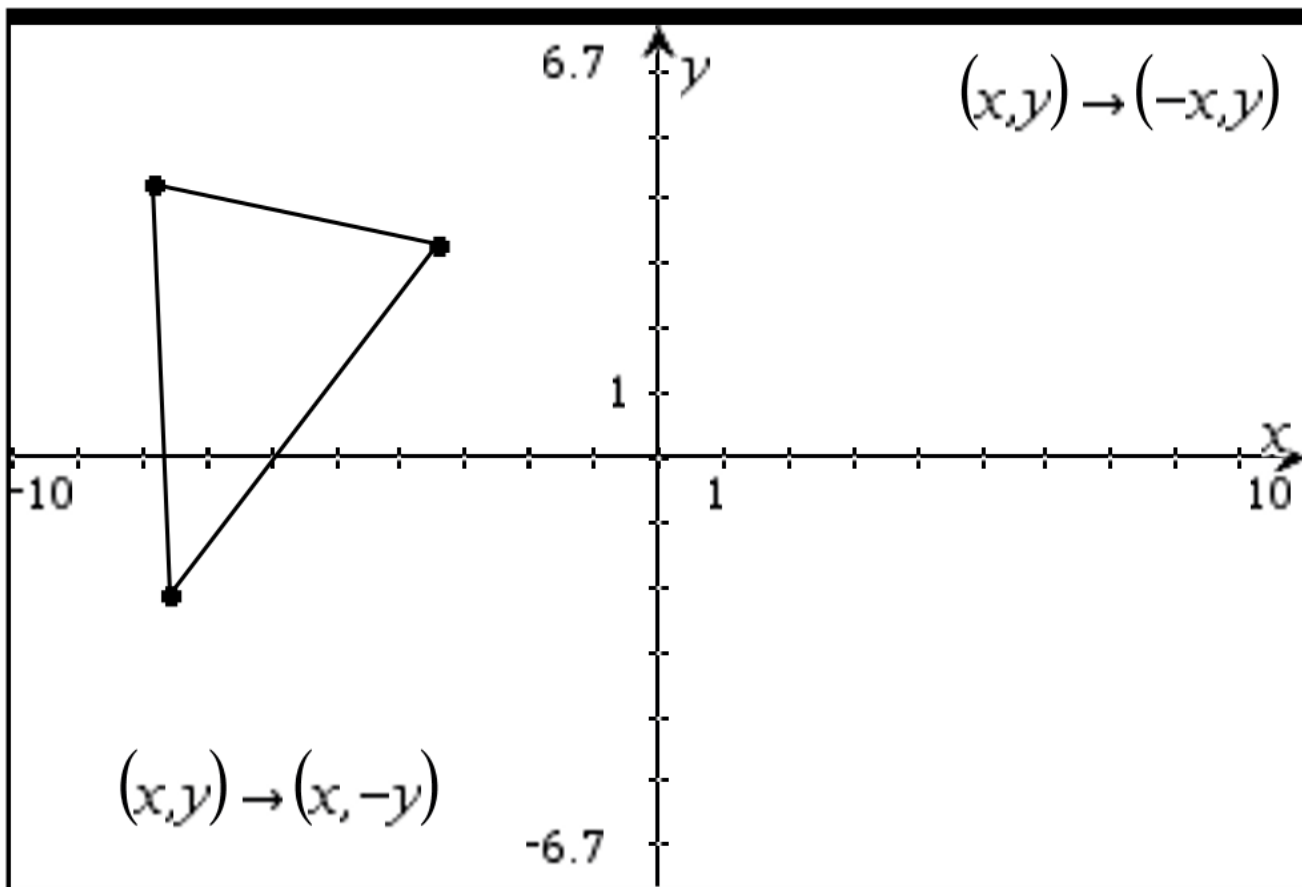
Translations





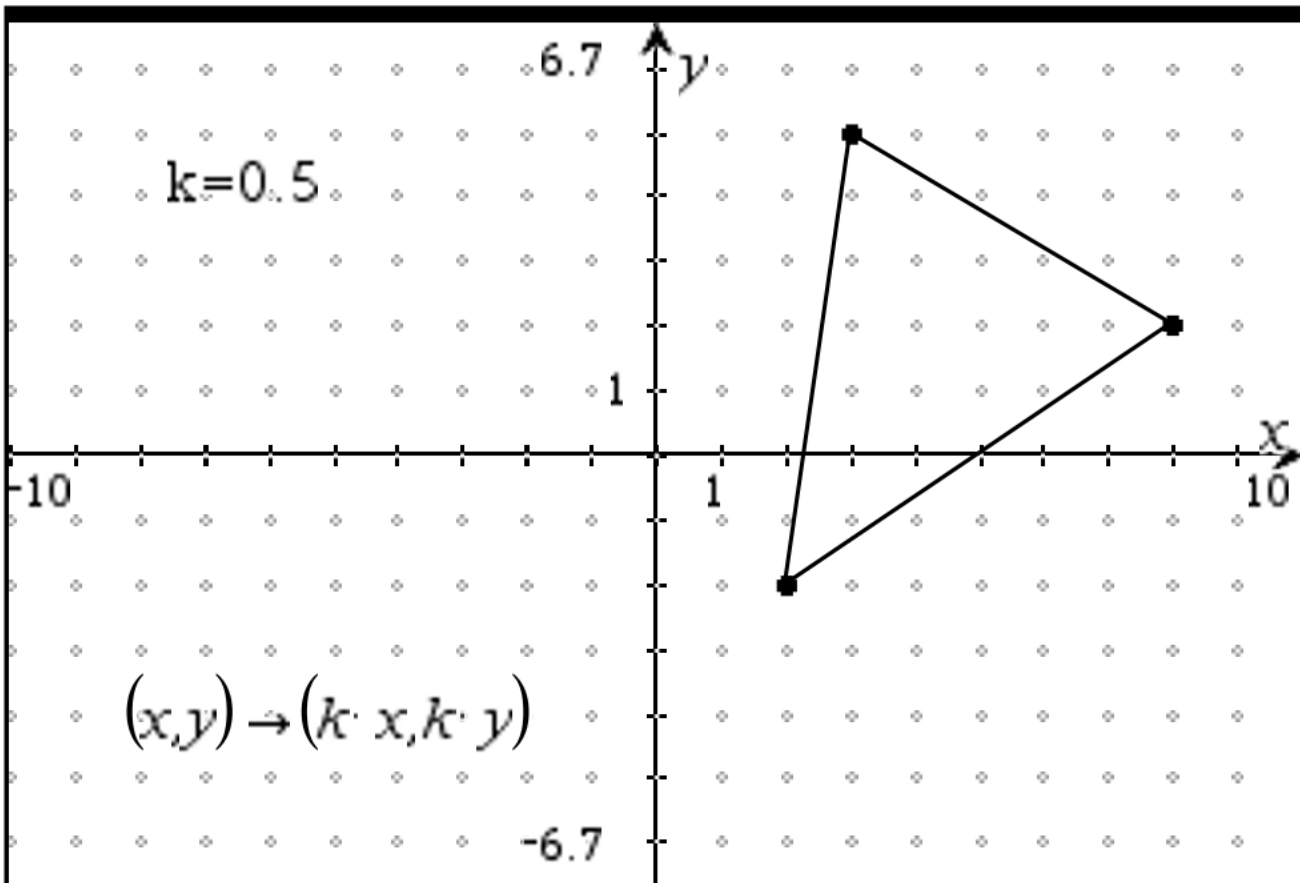
Problem 2

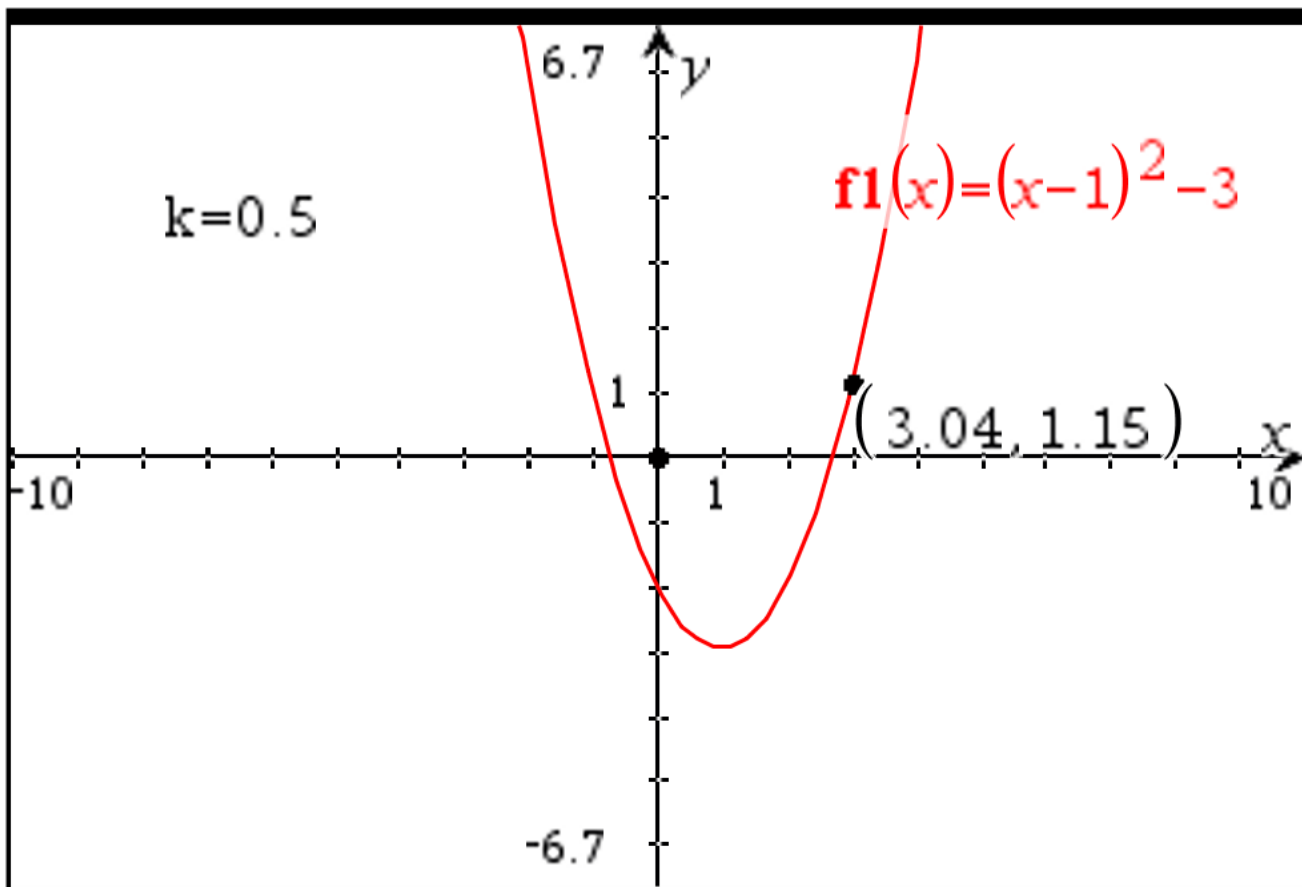
Reflections



Problem 3

Dilations





Problem 4

Rotations

