AP Calculus AB | Activity 0821 | Name:
Dr. Paul L. Bailey | Monday, August 21, 2023

Exercise 1. Let T be the triangle with vertices $A(1,2)$, $B(2,4)$, and $C(2,6)$. Compute and graph sets obtained from the following transformations of T.

(a) none

(b) shift left 7 and up 3;

(c) shrink horizontally by a factor of 2 and stretch vertically by a factor of 3;

(d) reflect across the x-axis, the y-axis, and both.

Exercise 2. Consider the equation $x^2 + y^2 = 4$. Find and graph the equations obtained by the following transformations of this equation.

(a) none;

(b) shift right 3 and left 4;

(c) shift right 3 and left 4, then stretch horizontally by 2 and vertically by 3;

(d) shift right 3 and left 4, then stretch horizontally by 2 and vertically by 3, then rotate around the origin.

Exercise 3. Consider the function $f(x) = 2x - 4$. Find and graph the functions obtained by the following transformations of this function.

(a) none;

(b) shift right 4;

(c) shift down 3;

(d) stretch horizontally by a factor of 2;

(e) shrink vertically by a factor of 2;

(d) shift left 2 and down 4, then stretch vertically by a factor of 2, then reflect across the y-axis.

Exercise 4. Consider the function $f(x) = x^2$. Find and graph the functions obtained by the following transformations of this function.

(a) none;

(b) shift right 4;

(c) shift down 3;

(d) stretch horizontally by a factor of 2;

(e) shrink vertically by a factor of 2;

(d) shift left 2 and down 4, then stretch vertically by a factor of 2, then reflect across the y-axis.