Practice 5.1.2: Transformations As Functions

Use what you know about transformations to answer the questions.

1. When described as functions, can transformations be combined?

2. Given the expression $f(g(k(x)))$, where f, g, and k are functions, what operation should be performed first? Does the order matter? Why or why not?

3. What does it mean for a transformation to be isometric?

4. A figure is transformed by $T_{3,-1}$ and then transformed by $T_{-3,1}$. How does the preimage relate to the final image?

5. If the transformation T is isometric and $d(PQ)=2$, what is $d(T(PQ))$?

6. Given $T_{h,k}(x,y)=(x+h,y+k)$ and the point P (2, 3), what is $T_{5,4}(P)$?

7. Using the form $T_{h,k}(x,y)=(x+h,y+k)$, how can we describe a translation S that moves a point left 5 units and down 1 unit in the coordinate plane?

8. Given $R_{90}(x, y) = (-y, x)$ and the point Q (1, 0), what is $R_{90}(Q)$?

9. Find $T(S(x, y))$ if $T(x,y)=(x+2,y+2)$ and $S(x,y)=(x-5,y+1)$. Label your answer P. What values of h and k would prove the equation $T_{h,k}(P) = (x, y)$ true?

10. Given $T_{2,5}(x, y) = (x + 2, y + 5)$, state the translation that would yield the identity transformation, $I = T_{h,k}(T_{2,5}(x, y))$.