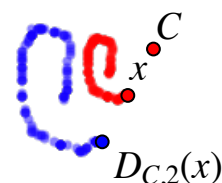


In this Geometric Functions activity you will *compose* two functions by merging the input of the second to the output of the first.

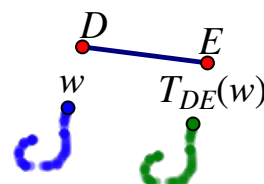
1. In a new sketch, construct point x and C , and dilate x about C by a scale factor of 2.
2. Label the dependent variable as shown, color it blue, and turn on tracing for both variables.



Q1 Drag x to make an interesting shape. On your paper draw the shapes made by x and $D_{C,2}(x)$.

Q2 Describe the behavior of function $D_{C,2}$.

3. Erase the traces, and construct point w and segment DE . Mark the vector from D to E .



4. Translate w by vector DE . Label the dependent variable as shown.

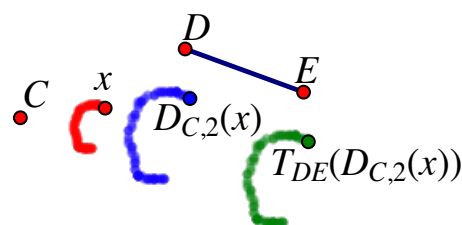
Q3 Turn on tracing and drag w . Draw the resulting shapes on paper.

Q4 Describe the behavior of function T_{DE} .

5. Erase traces, select $D_{C,2}(x)$ and w , and choose **Edit | Merge Points**.

Q5 Describe what happens.

Q6 Label the merged point $T_{DE}(D_{C,2}(x))$. Explain why this label makes sense, and write down in words how you would read it.



Q7 Erase traces, drag x , and draw the resulting shapes on your paper.

Q8 Construct a polygon domain, predict the range of the composed function, and use the **Marker** tool to draw your prediction.

Q9 Restrict x to the polygon, animate x , and draw the result.

Q10 Describe the traces in words. Which points are connected by $D_{C,2}$? Which points are connected by T_{DE} ?

6. Hide point $D_{C,2}(x)$ by selecting it and choosing **Display | Hide Point**, and erase the traces. Then drag again to observe the behavior of the composed function.

EXPLORE MORE

7. In a new sketch combine two other transformations of your choice.