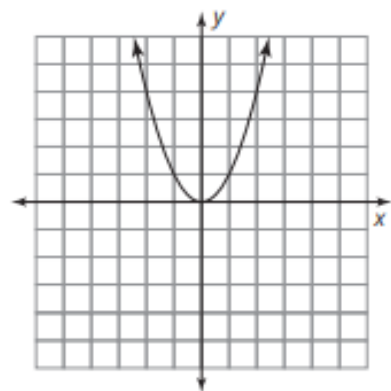


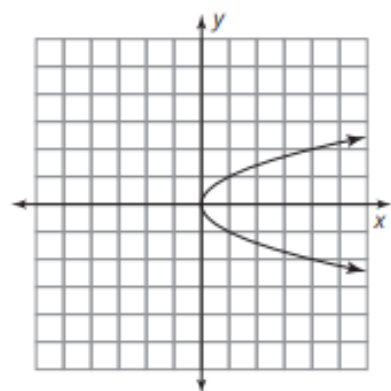
Warm Up

Determine whether each graph represents a function. Explain your reasoning.

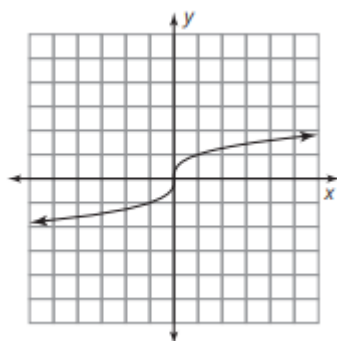
1.



2.

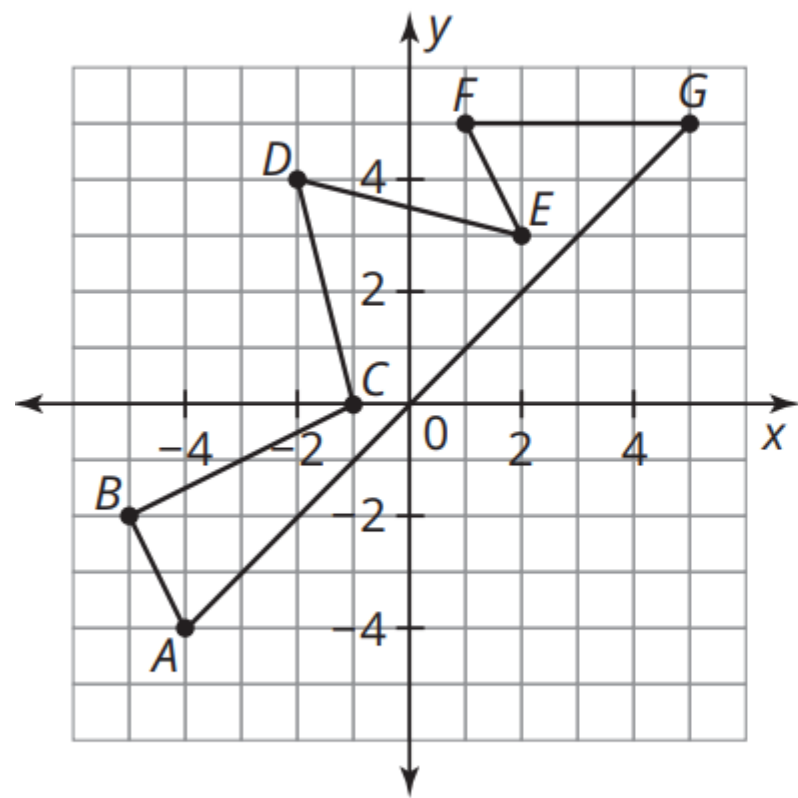


3.



Reflect on It

M3-8



Consider the polygon drawn on the coordinate plane.

1. Trace the polygon and the axes onto a piece of patty paper.
 - a. Describe how you can use your tracing to show a reflection of the polygon across the line $y = x$.
 - b. Describe the location of the x - and y -axis on your patty paper in the reflection.

2. Draw the reflection of the polygon across $y = x$ on the same coordinate plane shown.
3. Write the coordinates of the named vertices of the polygon after a reflection across $y = x$.
4. Compare the coordinates of the vertices of the original polygon with the coordinates you wrote in Question 3.
5. Predict what the graph of the function $f(x) = x^2$ would look like when reflected across $y = x$. Explain your reasoning.

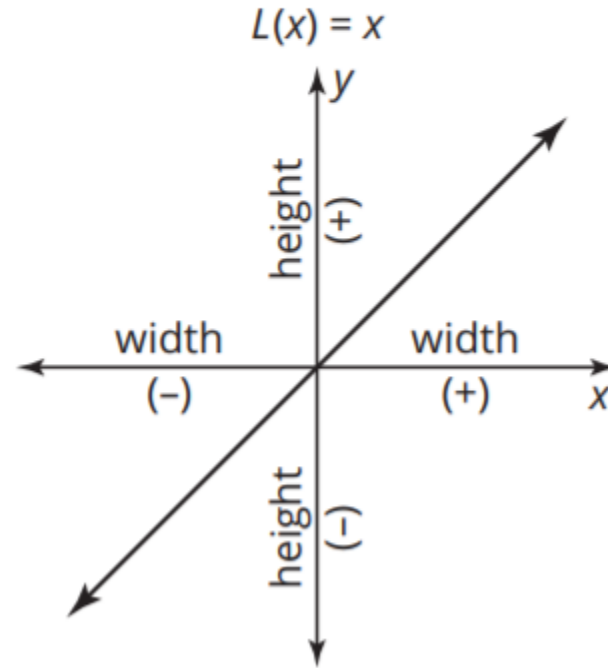
The graphs located at the end of this lesson show these 6 power functions.

$$L(x) = x \quad Q(x) = x^2 \quad C(x) = x^3 \quad F(x) = x^4 \quad V(x) = x^5 \quad S(x) = x^6$$

- 1. Trace each graph onto a separate piece of patty paper and label the axes as shown on the original graph. Label each function to help you identify them.**

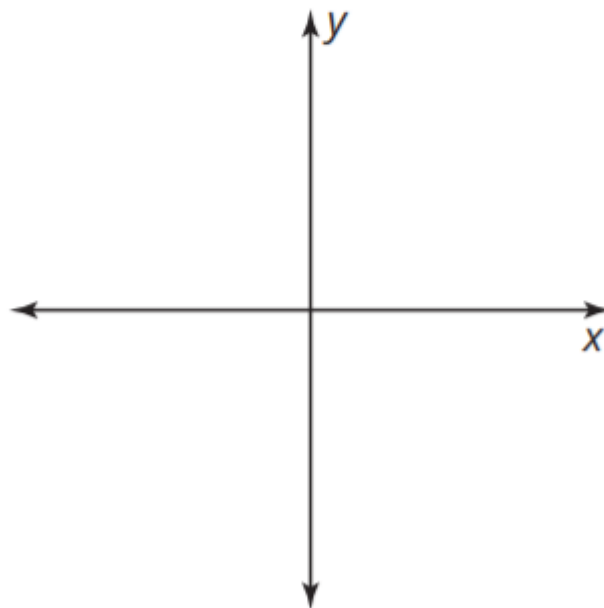
2. The graph of the linear function $L(x) = x$ models the width of a square as the independent quantity and the height of the square as the dependent quantity.

M3-9

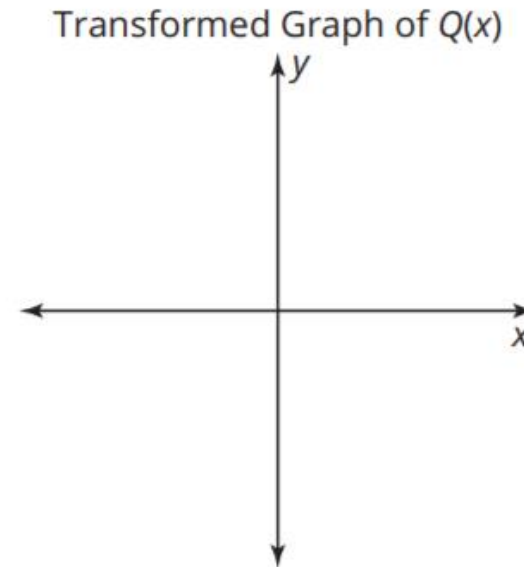
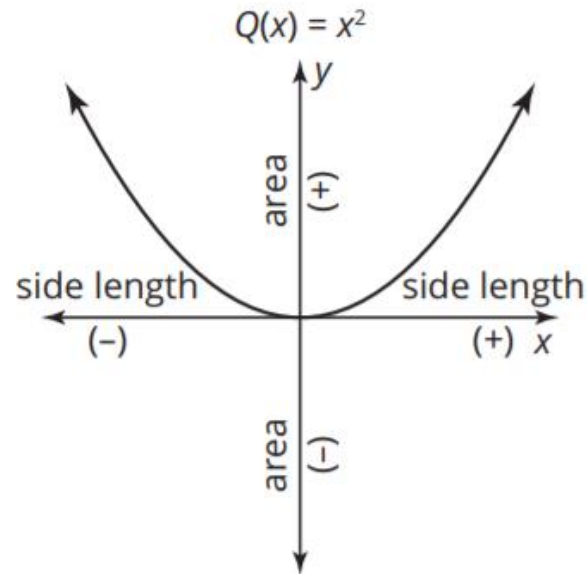


- a. Use the patty paper image of $L(x)$ to transform the graph so that it shows the height as the independent quantity on the horizontal axis and the width as the dependent quantity on the vertical axis. Then sketch the resulting graph and label the axes.

Transformed Graph of $L(x)$



3. The graph of the quadratic function $Q(x) = x^2$ models the side length of a square as the independent quantity and the area of the square as the dependent quantity.
- a. Use the patty paper image of $Q(x)$ to transform the graph so that it shows the area as the independent quantity on the horizontal axis and the side length as the dependent quantity on the vertical axis. Then sketch the resulting graph and label the axes.



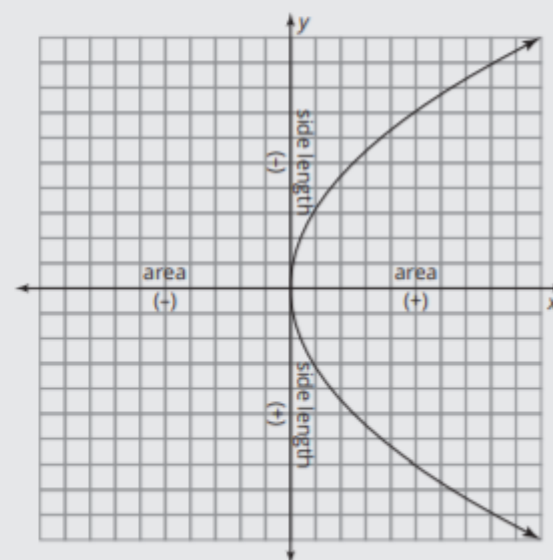
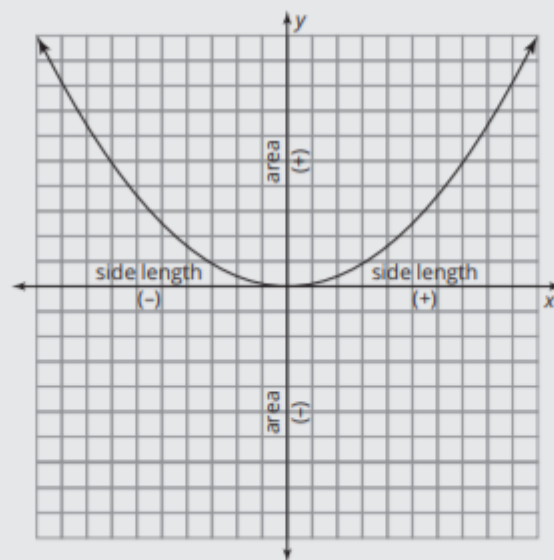
- b. Describe the transformations you used to transpose the independent and dependent quantities.**

- c. Is the resulting graph a function? Explain your reasoning.**

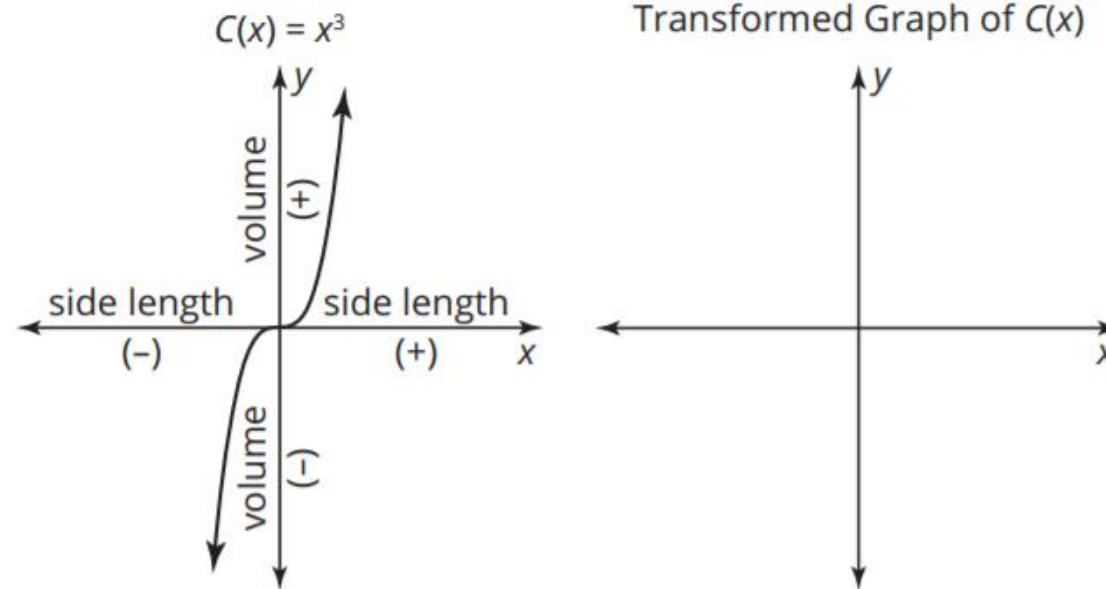
- d. Cole used an incorrect strategy to transpose the independent and dependent quantities. Describe why Cole's strategy is incorrect.

Cole

I can rotate the graph 90° clockwise to transpose the independent and dependent quantities.



4. The graph of the cubic function $C(x) = x^3$ models the side length of a cube as the independent quantity and the volume of the cube as the dependent quantity.
- a. Use the patty paper image of $C(x)$ to transform the graph so that it shows the volume as the independent quantity on the horizontal axis and the side length as the dependent quantity on the vertical axis. Then sketch the resulting graph and label the axes.



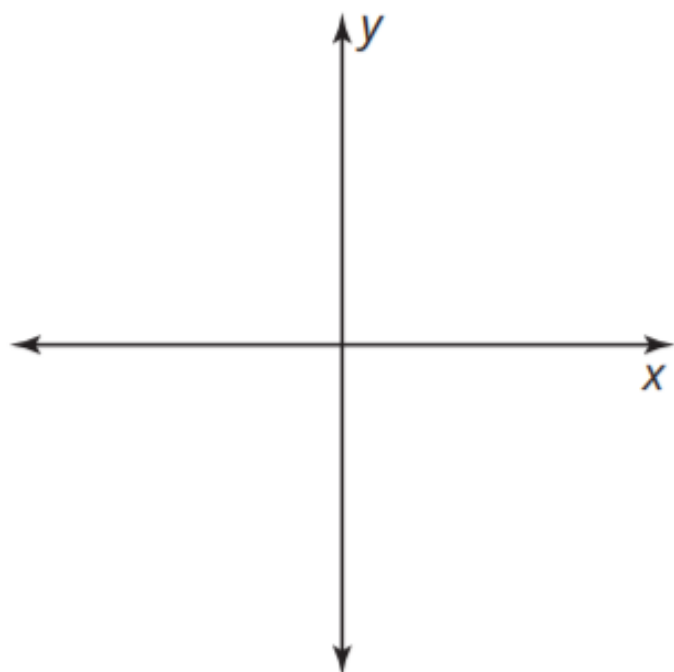
- b. Describe the transformations you used to transpose the independent and dependent quantities.**

- c. Is the resulting graph a function? Explain your reasoning.**

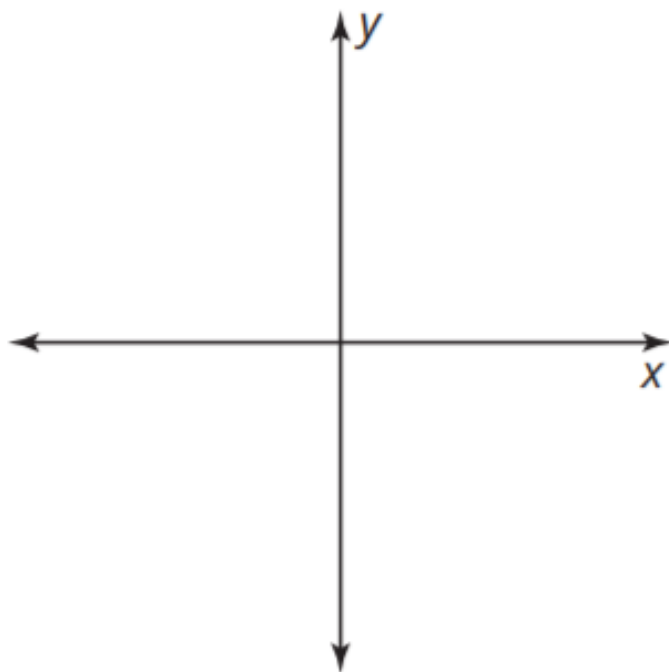
- d. Compare the graph of $C(x) = x^3$ to the resulting graph. Interpret both graphs in terms of the side length and volume of a cube.**

1. Use your traced graphs and Deanna's strategy to sketch the graphs of the inverses of $F(x) = x^4$, $V(x) = x^5$, and $S(x) = x^6$.

inverse of $F(x) = x^4$



inverse of $V(x) = x^5$



inverse of $S(x) = x^6$

