

Inverse Function Project

General Information

Course: Math Academy 1

Chapter: two

Assigned: Friday, September 13

Due: Wednesday, October 2

Group Size: 1 to 3 people

Format: constructed display

Summary: Graph a function and find its inverse both algebraically and physically.

Bonus: Make it usable by teachers to demonstrate function inverses by making it easily erasable and reusable, sturdy, and professional.

Directions

1. Choose a nonlinear one-to-one function $f(x)$.
2. Graph $f(x)$ on a perfectly square sheet of paper or other material at least 20 cm wide. If your material is not transparent, use ink that is dark enough that it can easily be seen through the material. A computer printout is recommended, although the graph may need to be traced over with marker to be able to be seen easily through the paper.
3. Write the equation for $f(x)$ in the bottom right corner of the paper, this time using lighter ink not easily seen through the paper.
4. Put the square into a frame, attached at the top right corner and bottom left corner so it can rotate about the line $y = x$ to show the inverse function through the paper.
5. Rotate the square so that the inverse side is showing, and in the new bottom right corner write the equation for $f^{-1}(x)$, again using lighter ink.

Scoring

[A] Content: ____ / 20

- 2 The criterion is clearly met.
1 The criterion is addressed to a meaningful but limited extent.
0 The criterion is not addressed in a meaningful way.

1 2

- The function is nonlinear.
 The function is one-to-one.
 The square rotates exactly on the $y = x$ diagonal.
 The square rotates easily on the $y = x$ diagonal.
 The inverse function can be clearly seen through the paper.
 The inverse function is correctly identified.
 Notation is correct.
 The square is at least 20 cm wide.
 The equations are written in the correct place.
 The project is complete and shows that you have an understanding of the concepts.

[B] Presentation: ____ / 10

- 3 The project is impressive in this aspect, and it appears carefully planned and created.
2 The project is reasonable in this aspect.
1 The project looks like it was done in a hurry in this aspect.
0 The project is difficult to follow because of this aspect.

1 2 3

- The construction is neat.
 The construction is attractive.
 The construction is sturdy.
 Your names are on the bottom of the construction only.

[C] Bonus: ____ / 0

- +5% The aspect is true to a meaningful but limited extent.
+10% Your work is exemplary in this aspect.

5 10

- You show an understanding of the concepts explored.
 The goal has been achieved.
 The final product is impressive.