

Inverse Function Project

General Information

Course: Math Academy I

Chapter: two

Assigned: Monday, September 19

Due: Thursday, October 13

Points: 30

Group Size: 1 to 3 people

Format: constructed display

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

Bonus: For up to +40%, 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 is recommended, but 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] Your project achieves its intended purpose of physically demonstrating an inverse function, and the equation is correct.**
- 10 Your square rotates easily and exactly on the $y = x$ diagonal, the inverse function can be seen clearly through the paper, and the equation of the inverse function is correct.
- 8-9 Your square rotates approximately on the $y = x$ diagonal, the function can be seen easily through the paper, and the equation of the inverse function is correct.
- 5-7 Your square rotates approximately on the $y = x$ diagonal, but it is hard to see the function through the paper or the inverse is not a function or does not have the correct equation.
- 1-4 Your square does not rotate on the $y = x$ diagonal.
- [X] All steps are completed.**
- 10 All stated directions are followed.
- 1-9 One or more aspects of the project is omitted or incomplete.
- [Y] The final product is sturdy and attractive.**
- 10 The display is sturdy, neat, and attractive.
- 1-9 The durability or aesthetic quality of the display is not superior.