

Inverse Function Project

General Information

Course: Math Academy 1

Chapter: two

Assigned: Wednesday, October 7

Due: Tuesday, October 27

Group Size: 1 or 2 people

Format: constructed display with video submission

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

Bonus: Make your graph erasable, and demonstrate two different functions and their inverses.

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.

Submission

6. Print or copy the second page of this document ("scoring").
7. Make a video of yourself showing your display and explaining what makes your function is nonlinear. Check the box under 2 if your function is in fact nonlinear.
8. Explain each of the other nine items criteria list [A], and mark 2 for those that are clearly met and 1 for those that are addressed in a meaningful but limited way.
9. Submit the video and the checklist to Google Classroom.

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 is at least 20 cm wide.
 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 correct.
 Notation is correct.
 The equations are each written right-side up in the bottom of quadrant IV.
 The construction demonstrates the concept of an inverse.

[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 attractive.
 The scores you give yourself are clearly justified in the video.
 The video is under three minutes and/or entertaining.
 Your names are in the title of the file or the first frame of the video.

[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.