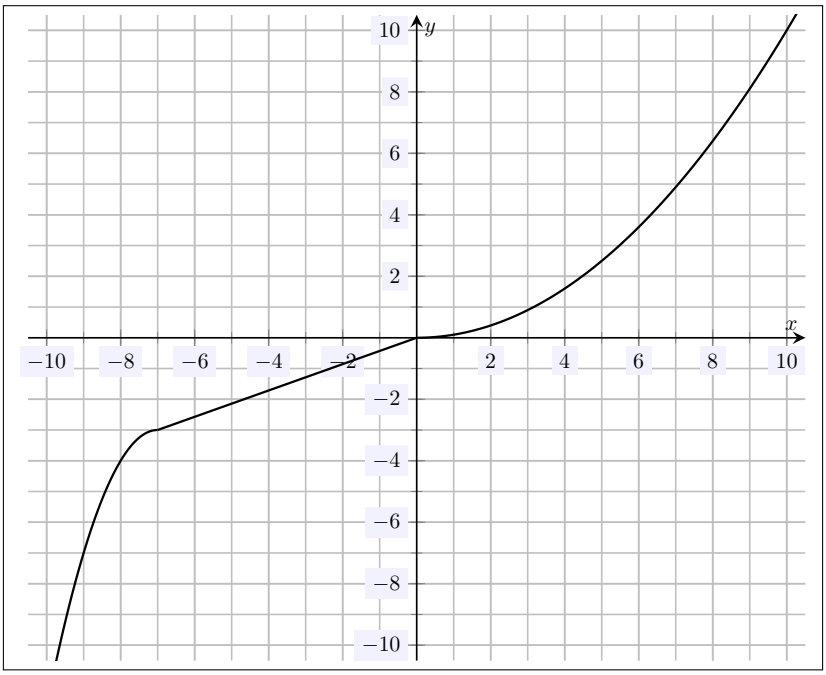
Name: _____

MATH 101
Fall 2023
HW 10: Due 10/30

"The study of mathematics, like the Nile, begins in minuteness but ends in magnificence."

– Charles Caleb Colton

Problem 1. (10pt) Consider the relation f plotted below.



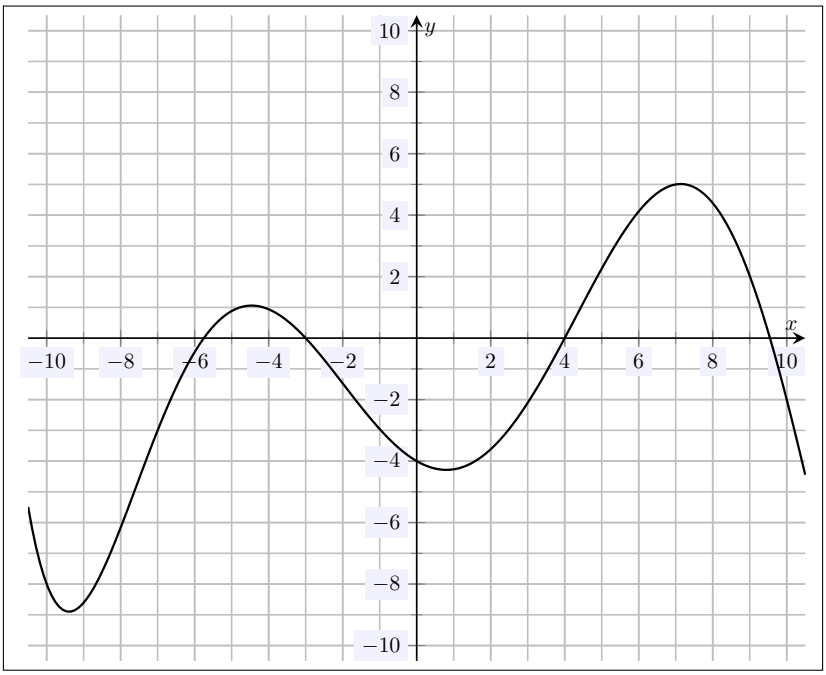
(a) Compute $f(7)$ and $f(-9)$.

(b) Is $f(x)$ a function? Explain.

(c) Does $f(x)$ have an inverse? If so, sketch the inverse. If not, explain why.

Problem 2. (10pt) Showing all your work, verify that $g(x) = 4x + 9$ is the inverse function for $f(x) = \frac{x-9}{4}$. Also, compute $g(-2)$. What does the value of $g(-2)$ tell you about the function $f(x)$?

Problem 3. (10pt) A relation ϕ is plotted below.



Using the plot above, answer the following:

(a) Compute $\phi(9)$.

(b) Find the y-intercept for $\phi(x)$.

(c) Find the x-intercepts for $\phi(x)$.

(d) As accurately as possible, compute the preimage of -3, i.e. $\phi^{-1}(-3)$.

(e) Explain why (d) implies that ϕ does not have an inverse function.