Name: _____

MATH 104
Spring 2023
HW 3: Due 05/04

"Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist."

–Kenneth Boulding

Problem 1. (10pt) Simplify the following as much as possible:

(a) $\dfrac{x^2y^{-3}\cdot x^5y^2}{xy^3}$

(b) $\left(x^{-2}y^3\right)^{-2}$

(c) $\left(\dfrac{x^4}{y^3}\right)^{-1/2}$

(d) $\sqrt[3]{x^6y^3}$

(e) $xy\left(\dfrac{x^6}{y^3}\right)^{1/2}$

Problem 2. (10pt) Define a function $f(x) = 3\left(2^{1-3x}\right)$.

(a) Write $f(x)$ in the form $y = Ab^x$. What are A and b?

(b) Is $f(x)$ increasing or decreasing? Explain.

(c) Is $f(x)$ concave up or concave down? Explain.