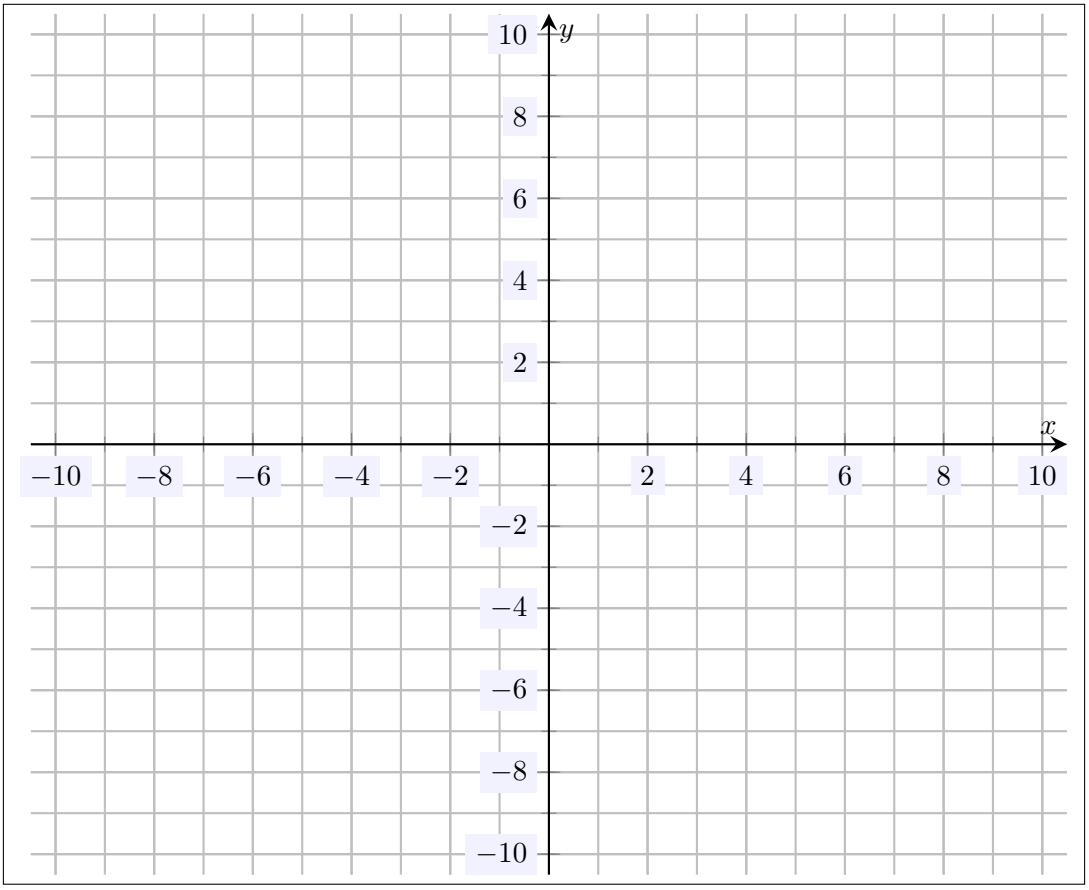
Name: _____

MATH 101
Summer 2022
HW 10: Due 06/14

"Somewhere, something incredible is waiting to be known."

– Carl Sagan

Problem 1. (10pt) Sketch the function $f(x) = \frac{11}{3}\left(\frac{1}{2}\right)^x$ as accurately as possible on the graph below.



Problem 2. (10pt) Showing all your work, determine whether the following functions are increasing or decreasing:

(a) $-5\,(2)^{-\frac{1}{5}x}$

(b) $\frac{7}{8}\left(\frac{5}{6}\right)^{4x}$

(c) $17\left(\frac{5}{4}\right)^{-x}$

(d) $-10\left(\frac{1}{3}\right)^{-5x}$

Problem 3. (10pt) Showing all your work, solve the following equation:

$$2^{3x} = 4$$

Problem 4. (10pt) Showing all your work, solve the following equation:

$$7(4^{1-x}) = \frac{7}{16}$$

Problem 5. (10pt) Showing all your work, solve the following equation:

$$\frac{1}{3^x} = 27^{\frac{4x+10}{3}}$$

Problem 6. (10pt) Showing all your work, solve the following equation:

$$5^{x-2} + 6 = 11$$

Problem 7. (10pt) Showing all your work, solve the following equation:

$$\frac{1}{4^x} = 1024$$

Problem 8. (10pt) Showing all your work, solve the following equation:

$$\left(\frac{2}{3}\right)^{5x-7} = 1$$

Problem 9. (10pt) Suppose you invest $5,000 in an account which earns 4.6% annual interest, compounded quarterly. How much will be in the account after 3 years?

Problem 10. (10pt) If you take out a loan for $1,200 at a 5.5% annual interest, compounded continuously, how much is owed after 2 years? How much of this amount is interest?