AMAT100: Precalculus
Worksheet 4

Due: Due Friday 3/29 digitally

—— Instructions ——

- This homework should be submitted in class or digitally on the date listed above.
- There are three main ways you might want to write up your work.
  - Write on this pdf using a tablet
  - Print this worksheet and write in the space provided
  - Write your answers on paper, clearly numbering each question and part.
    - If using either of the last two options, you can use an app such as Microsoft Lens to take pictures of your work with your phone and convert them into a single pdf file.
- **You must show all work**. You may receive zero or reduced points for insufficient work. **Your work must be neatly organised and written**. You may receive zero or reduced points for incoherent work.
- If you are writing your answers on anything other than this sheet, you should only have **one question per page**. You can have parts a), b) and c) on the page for example, but problems 1) and 2) should be on separate pages.
- **Put a box or circle around your final answer** for each question.
- The problems on this assignment will be **graded on correctness and completeness**.
- These problems are designed to be done without a calculator. Whilst there is nothing stopping you using a calculator when working through this assignment, be aware of the fact that you are not permitted to use calculators on exams so you might want to practice without one.

1. Some values of the function $f(x)$ are given in the table below.

x	$f(x)$
-1	-54
2	k
3	$-\frac{2}{3}$

Find the value of k if

(a) $f(x)$ is linear.

(b) $f(x)$ is exponential.

2. Transformations of Exponential and Logarithmic Functions

   (a) Let $f(x) = 7^x$.
   Let $g(x)$ be the following transformation of $f(x)$:
   Shift $f(x)$ down by 15 units and to the left by 34 units. Write the equation for $g(x)$. *Do not simplify.*

   (b) Let $h(x)$ be the following transformation of $g(x)$ Stretch your $g(x)$ from part (a) vertically by a factor of 17. Write the equation for $h(x)$ *Do not simplify.*

   (c) Let $k(x) = \log(x)$. Let $v(x)$ be the reflection of $k(x)$ over the y-axis. Write the equation for $v(x)$. *Do not simplify.*

3. Rules of Logarithms

   (a) Write as a single logarithm:

$$6\ln(2x) + \ln(a) - 13\ln(v) + \ln(b) + \ln(x)$$

   (b) Expand the following logarithm:

$$\log\left(\frac{ab}{cd}\right)^r$$

4. Exponential Equations
   Solve for x.

$$2^{(x+7)} \cdot 32^{(x+12)} = 4^{(x-8)} \cdot 64^{(x+14)}$$

5. Logarithmic Equations
   Solve for x.

$$\log(x^2 + 16x - 27) = \log(2x^2 + 17x - 57)$$