Name: _____

MATH 101
Winter 2021
HW 11: Due 01/21

"Yeah, I'm not a temp anymore. I got Jim's old job. Which means at my 10-year high school reunion, it will not say 'Ryan Howard is a temp.' It will say, 'Ryan Howard is a junior sales associate at a mid-range paper supply firm.' That'll show 'em."

–Ryan Howard, The Office

Problem 1. (10pt) Showing all your work, compute the following:

(a) $\log_3(27) - \log_3(3) + \log_3(1)$

(b) $\log_6\left(\frac{1}{36}\right)$

(c) $\log_{12}(12^{1/5})$

Problem 2. (10pt) Showing all your work, compute the following:

(a) $\ln(e^2) + 3\ln(1)$

(b) $\ln(\sqrt[3]{e})$

(c) $\ln(e^{4/3})$

Problem 3. (10pt) Showing all your work, write the following in terms of $\log x$ and $\log y$.

$$\log_6 \left(\frac{36x^5}{\sqrt{y}} \right)$$

Problem 4. (10pt) Showing all your work, write the following in terms of $\log x$, $\log y$, and $\log z$.

$$\ln\left(\frac{z^6\sqrt[3]{x^2}}{y^5}\right)$$

Problem 5. (10pt) Without using negative powers, write the following as a single logarithm:

$$-6\log_2(x) + \frac{3}{2}\log_2(y) - 8$$

Problem 6. (10pt) Without using negative powers, write the following as a single logarithm:

$$\frac{6\ln x - 2\ln y + \ln z}{2}$$

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

$$\log_5(2x - 3) + 8 = 10$$

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

$$\ln(1-x) = \frac{2}{3}$$

Problem 9. (10pt) Showing all your work, solve the following equation:

$$11^{-x} - 12 = 20$$

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

$$2\ln(x) - 4 = 6 - \ln(x)$$