Suggested Problems for Thursday, August 30

Use the laws of exponents and logarithms to simplify the following expressions:

1. \(81^{3/4}\) Express this as a power of 3.
2. \(\frac{4^{5/2} \cdot (-8)^{4/3}}{64^{2/3}}\) Express this as a power of 2.
3. \(\frac{a^{-5/2} \cdot a^{1/3}}{a^3 \cdot a^0}\) Express this as a power of \(a\).
4. \(x^{2/3} + 2x^{5/3} - 3x^{11/3}\) Hint: Factor out \(x^{2/3}\).
5. \(\log_{10} 1,000,000 + \log_{10} 10,000 - \log_{10} 0.001\) Simplify and compute the logarithm.
6. \(\ln 23.2 + \ln 5.7 + \ln 101\) Express this as the natural logarithm of a single number.
7. \(\log a^3 \cdot \log a^4\) Hint: Careful!
8. \(\log_2 8^{12}\)
9. \(\log_{10} \frac{1}{\sqrt{10}}\)

Solve the following equations involving exponents and logarithms:

1. \(5^{x+1} = 0.125\)
2. \(\log_2 (x^2 + 4) = 3\)

Graph the following exponential and logarithmic functions:

1. \(y = \left(\frac{1}{2}\right)^x\)
2. \(y = 3^{-x}\)
3. \(y = 2^{-x^2}\)
4. \(y = \log_2 (x + 4)\)
5. \(y = \log_3 (x^2 + 1)\)

For additional practice with the exponentials, look at problems 19–42 in Appendix A1 and problems 1–24 in Section 4.1.
For additional practice with logarithms, look at problems 3–32 in Section 4.2.

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