Math 135: Discrete Mathematics, Fall 2012
Homework 0

Due *in class* on Friday, Aug. 31, 2012

Submit your solutions for this homework *in class* on Friday, August 31. Please make sure to read the course policies on homework *before* writing up your homework.

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1. Simplify the following expressions as much as possible, **without using a calculator (either hardware or software)**. Do not approximate. Express all rational numbers as improper fractions.

(a) $21/3$	(b) $\frac{5}{2} + \frac{2}{5}$	(c) $\sqrt{\pi^{3456}}$
(d) $2^{32} \bmod 3$	(e) $\frac{\ln 432}{\ln 5}$	(f) $\log_2 1024$
(g) $\log_2 8^x$	(h) $(x^2+1)(6x+5)$	(i) $(x^{x+2}+2)^2$
(j) $\log_2 6 + \log_2 11$	(k) $\sum_{r=1}^{103} 2^r$	(l) $\prod_{\ell=1}^{r} 2^\ell$

2. Suppose $F(x) = x^2 - 3x + 2$ and $G(y) = y + 2$.

   (a) What is $F(a)$?

   (b) What is $F(G(z))$?

   (c) What is $G(G(G(G(G(10)))))$?

   (d) What is $F(1) * (F(G(\sqrt{\pi}))$? Hint: Do not use a calculator.

   (e) Let $P(x)$ be the sentence "All I want for Christmas is my x front teeth.". Write the sentence $P(F(4))$ in colloquial English (no formulas).