

Math 135: Discrete Mathematics, Fall 2010

Homework 0

Due *in class* on Friday, August 27, 2010

Submit your solutions for this homework *in class* on Friday, August 27. Please make sure to read the course policies on homework *before* writing up your homework.

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

(a) $12/8$	(b) $\frac{7}{3} + \frac{3}{7}$	(c) $\sqrt{\pi^{1234}}$
(d) $2^{10000} \bmod 3$	(e) $\frac{\ln 256}{\ln 2}$	(f) $\log_2 8^c$
(g) $(\log_2 13)(\log_2 5)$	(h) $(x^{x+2} + 2)^2$	(i) $\frac{\beta^3 + 1}{\beta^2 - \beta + 1}$
(j) $\log_2 13 + \log_2 5$	(k) $\sum_{r=1}^{\ell} 2^r$	(l) $\prod_{\ell=1}^r 2^{\ell}$

2. Suppose $F(x) = x^2 - 3x + 2$ and $G(y) = y + 10$.

- What is $F(a)$?
- What is $F(G(z))$?
- What is $G(G(G(G(G(10))))))$?
- What is $F(1) * (F(G(\sqrt{\pi})) + G(F(\sqrt{\pi})))$? Do not use a calculator.
- 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).