DISCRETE MATHEMATICS
Math 245
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Assignments for Ch 3

1. Exercises with representations of integers.
   (a) Convert 361 in base 10 to binary and to octal.
   (b) Convert 110110_2 and 555_8 to base 10.
   (c) Make a multiplication table for one digit numbers base 8.
   (d) Find the product in octal, $36_8 * 74_8$.

2. Mimic the proof that $\sqrt{2}$ is irrational to prove that $\sqrt{3}$ is irrational.

3. We know that the product of two rational numbers is rational. Prove by contradiction that the product of a nonzero rational and an irrational is irrational.

4. Prove the following result using the definition of floor (See Epp 2nd Ed. and 3rd Ed 3.5 #23-24, do not use #23 to prove this problem.) Let x be a real number and let m be an integer. If x is not an integer then $\lfloor x \rfloor + \lfloor m - x \rfloor = m - 1$.