Section X.5 Homework

ORAL:

1. Determine the base-10 form of the following

    (a) 11101001_2

    (b) 300245_6

    (c) 14367_{11}

    (d) $3b7f2_{16}$

    (e) $math_{36}$

2. Compute the following (without converting to base-10)

    (a) $423578_{11} + 34289_{11}$

    (b) $100010101_2 - 101110_2$

    (c) $1011_2 \times 101_2$

    (d) $45_{20} \times 87_{20}$

3. Convert the following base-10 numbers into the given base

    (a) 597 to base 4

    (b) 1239487 to base 16

    (c) 89 to base 3

    (d) 9332 to base 9

4. Convert the following p-adic numbers into rational numbers of the form $\frac{a}{b}$.

    (a) $...2222_{13} = \overline{2}_{13}$

    (b) $...4444_5 = \overline{4}_5$

    (c) $...261261261_7 = \overline{261}_7$

    (d) $...13131342_5 = \overline{13}42_5$

WRITTEN:

5. Give $\dfrac{-4}{9}$ as a 7-adic number. (Hint: Solve $\dfrac{a}{1 - 7^n} = \dfrac{-4}{9}$.)

6. Use the previous problem to solve $9x \equiv -4 \mod 7^4$.