Math 200 - Quiz 6

October 10, 2012

Name __key__

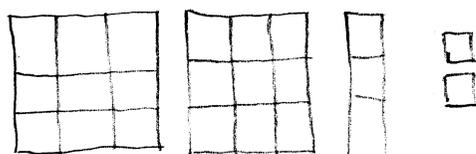Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (1 point) Convert 5376_{eight} to base ten.

$$5 \times 8^3 + 3 \times 8^2 + 7 \times 8^1 + 6 \times 8^0 =$$

$$5 \times 512 + 3 \times 64 + 7 \times 8 + 6 \times 1$$

$$= 2560 + 192 + 56 + 6 = \boxed{2814_{\text{TEN}}}$$

2. (1 point) Use base-three blocks to illustrate 212_{three}.

212_{THREE} = 2 FLATS, 1 LONG, 2 UNITS

NOTICE THAT

$212_{\text{THREE}} = 23_{\text{TEN}}$

3. (1 point) List the first eight natural numbers in base two.

1, 10, 11, 100, 101, 110, 111, 1000   ← ALL IN BASE TWO

4. (2 points) Convert 857 to base five.

$5^0 = 1$, $5^1 = 5$, $5^2 = 25$, $5^3 = 125$

$5^4 = 625$

$$857 = \boxed{11412_{\text{FIVE}}}$$

$5^4 = 625 \,)\, 857 \,(\, 1$
$\quad\quad -625$

$5^3 = 125 \,)\, 232 \,(\, 1$
$\quad\quad -125$

$5^2 = 25 \,)\, 107 \,(\, 4$
$\quad\quad -100$

$5^1 = 5 \,)\, 7 \,(\, 1$
$\quad\quad -5$

$5^0 = 1 \,)\, 2 \,(\, 2$
$\quad\quad -2$
$\quad\quad\quad 0$