

Math 200 - Quiz 4
February 24, 2010

Name key
Score _____

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

1. (1 point) Convert 22153_{six} to base ten.

$$2 \cdot 6^4 + 2 \cdot 6^3 + 1 \cdot 6^2 + 5 \cdot 6 + 3$$

$$2592 + 432 + 36 + 30 + 3 = \boxed{3093}$$

2. (1 point) Explain why 245031_{five} cannot be a base-five numeral.

THERE ARE 6 DIFFERENT DIGITS HERE,
AND A BASE-FIVE NUMERAL CAN HAVE ONLY 5.

Typically, 5 IS NOT A BASE-FIVE DIGIT.

3. (2 points) List the first 15 counting numbers in base four.

1, 2, 3, 10, 11, 12, 13, 20, 21, 22, 23, 30, 31, 32, 33

ALL IN BASE FOUR.

4. (1 point) Convert 6732 to base twelve. $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, T, E\}$

$$12^0 = 1, 12^1 = 12, 12^2 = 144, 12^3 = 1728, 12^4 = 20736 \text{ (Too Big)}$$

$$12^3 = 1728 \overline{) 6732} \quad (3$$
$$\quad \quad \quad - 5184$$

$$12^2 = 144 \overline{) 1548} \quad T$$
$$\quad \quad \quad - 1440$$

$$12^1 = 12 \overline{) 108} \quad 9$$
$$\quad \quad \quad - 108$$

$$12^0 = 1 \overline{) 0} \quad 0$$

$$6732 = \boxed{3T90_{\text{TWELVE}}}$$