

Math 200 - Quiz 5

March 2, 2011

Name key

Score _____

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

1. (1 point) Let $A = \{3, x, -2\}$ and $B = \{f, 0, z\}$. List all elements of the set $A \times B$.

$$A \times B = \{ (3, f), (3, 0), (3, z), (x, f), (x, 0), (x, z), (-2, f), (-2, 0), (-2, z) \}$$

2. (1 point) Explain why 34278_{eight} is not a correctly written base-eight numeral.

8 IS NOT A DIGIT IN BASE EIGHT.

3. (1 point) Convert 3412_{five} to base ten.

$$3 \times 5^3 + 4 \times 5^2 + 1 \times 5^1 + 2 \times 5^0 \\ = 3 \times 125 + 4 \times 25 + 5 + 2 = \boxed{482}$$

4. (1 point) Write the first twelve whole numbers in base four.

0, 1, 2, 3, 10, 11, 12, 13, 20, 21, 22, 23, ...

ALL IN BASE FOUR

5. (1 point) Convert 39 to base two.

$$2^0 = 1, 2^1 = 2, 2^2 = 4, 2^3 = 8,$$

$$2^4 = 16, 2^5 = 32, 2^6 = 64$$

$$2^5 = 32 \overline{) 39} \quad | \quad 1$$

$$2^4 = 16 \overline{) 7} \quad | \quad 0$$

$$2^3 = 8 \overline{) 7} \quad | \quad 0$$

$$2^2 = 4 \overline{) 7} \quad | \quad 1$$

$$2^1 = 2 \overline{) 3} \quad | \quad 1$$

$$2^0 = 1 \overline{) 1} \quad | \quad 1$$

$$\boxed{39 = 100111_{\text{Two}}}$$