

Math 205 Problem Solving - Exam I

February 22, 2006

Dr. K. Ivy

Name \_\_\_\_\_

Student Identification Number \_\_\_\_\_

**Directions: Read each exercise carefully. Write clearly and show all necessary work to arrive at correct answers. Give all numerical answers in exact form (i.e., no decimal approximations) unless otherwise indicated. Show all of your work on extra paper. Box in your final answer where applicable. Failure to follow directions could result in points deducted.**

1) Determine the next three terms in the sequence: **(5 pts each)**

A) 13, 18, 23, 28, 33, ...

B) 1, 8, 27, 64, ...

2) Use the method of finite differences to determine the next term in the following sequence: **(6 pts each)**

A) 1, 2, 7, 22, 53, 106, ...

B) 215, 124, 63, 26, 7, ...

3) A businesswoman went to the bank and sent half of her money to a stockbroker. Other than a \$2 parking fee before she entered the bank and a \$1 mail fee after she left the bank, this was all the money she spent. On the second day she returned to the bank and sent half of her remaining money to the stockbroker. Once again, the only other expenses were the \$2 parking fee and the \$1 mail fee. If she had \$182 left, how much money did she have before the trip to the bank on the first day? **(5 pts)**

4) A) Determine the number of chips for each box that will keep the scale tipped as shown below. **(4 pts)**

**(See textbook page 42, Figure 1.10)**

B) Then, using  $x$  for a variable, write the corresponding inequality for each scale and solve the inequality. **(4 pts)**

5) Teresa purchased pens for 50 cents each and pencils for 25 cents each. She purchased 10 more pencils than pens and gave the clerk a five-dollar bill, which was more than enough to pay the total cost. Let  $x$  represent the number of pens, and write an algebraic expression for each item in parts (A) through (C).

**(2 pts)** (A) The total cost in dollars of the pens

**(2 pts)** (B) The number of pencils

**(2 pts)** (C) The total cost in dollars of the pencils

6) For the universal set  $U = \{a, b, c, d, e, f, g\}$  and the sets  $A = \{a, c, e, g\}$ ,  $B = \{a, b, c\}$  and  $C = \{b, c, d, e, f\}$ , list the elements in the following sets. **(4 pts each)**

A)  $A \cap B$

B)  $A \cup B'$

C)  $A \cap (B \cup C)$

D)  $C \cap (B \cap A)'$

7) For the universal set  $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$  and the sets  $D = \{1, 5\}$ ,  $E = \{1, 2, 3, 4\}$  and  $F = \{4, 6\}$ :

**(3 pts each)**

A) Which two sets are equivalent?

B) Which two sets are disjoint?

C) Set  $D$  is a subset of which set?