

Math 40  
Fall 2013  
Exam 2: Chapter 2  
9/25/13  
Time Limit: 80 Minutes

Name (Print): \_\_\_\_\_

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This exam contains 2 pages (including this cover page) and 7 problems. Enter your name at the top of this page, and put your initials on all attached pages. Staple these together with this page.

You may *not* use your books, notes, or any calculator on this exam.

You are required to show your work on each problem on this exam. The following rules apply:

- **Organize your work** in a reasonably neat and coherent way **on separate paper**. Work scattered all over the page without a clear ordering will receive reduced credit.
- **Mysterious or unsupported answers will not receive full credit**. A correct answer, unsupported by calculations, explanation, or algebraic work will receive no credit; an incorrect answer supported by substantially correct calculations and explanations may receive partial credit.
- Do not cram your work into corners or into the margins.

Problem	Points	Score
1	18	
2	20	
3	10	
4	10	
5	10	
6	12	
7	20	
Total:	100	

1. Consider the system of equations 
$$\begin{aligned} 4x - 3y &= 7 \\ 4x + 5y &= 15 \end{aligned}$$
- (6 points) Make a table of values for each equation including at least 3 points in each.
  - (6 points) Construct a careful graph using points from the two tables to plot the lines.
  - (6 points) Use the graph to estimate the solution to the system of equations.
2. A furniture store sends out 25 boxes containing either a chair or a table. The cost of sending a chair is \$8 and the cost of sending a table is \$12. The store spends \$280 to ship the 25 boxes. The steps below guide you to using the algebraic method to determine how many chairs were sent and how many tables were sent.
- (5 points) Introduce two variables to use in your system of equations. Name each variable and write a short description for what it represents.
  - (5 points) In terms of your variables, how much does it cost to send the chairs? The tables?
  - (5 points) Write a system of 2 linear equations in your 2 variables.
  - (5 points) Solve the system to determine how many chairs were sent and how many tables were sent.

3. (10 points) Solve the system by elimination: 
$$\begin{aligned} 3x + 2y &= -3 \\ 5x - 4y &= 17 \end{aligned}$$
4. (10 points) A telephone bill totals \$73.20 for basic service charges and long distance charges. If the basic service charges are \$32.78 more than the long distance charges, how much of the bill was for basic service? Use algebra to solve the problem.
5. (10 points) The sum of the interior angles of a triangles is  $180^\circ$ . Given that  $\angle B$  is 5 more than  $\angle C$  and furthermore,  $\angle A$  is three times the sum of  $\angle B$  and  $\angle C$ , set up a system of three equations in three unknowns to find the degree measures of angles  $A, B$  and  $C$ . Solve the system find the degree measures of the angles.
6. (12 points) Solve the system by back-substitution:

$$\begin{aligned} 3x - 4y + 5z &= 2 \\ 7y - 4z &= 26 \\ 5z &= -15 \end{aligned}$$

7. Consider the system of three linear equations in  $x, y$  and  $z$ :

$$\begin{aligned} \frac{1}{3}x + \frac{2}{5}y &= z \\ x + \frac{1}{5}y &= z + 1 \\ 2x - z &= \frac{1}{5}y \end{aligned}$$

- (5 points) Clear the fractions from each equation.
- (5 points) Write the system in standard form.
- (5 points) Solve the system.
- (5 points) Check your answer. Does it work?