Midterm 1

Math 1030-006
10/06/04

Name: _________________________________

Read all of the following information before starting the exam:

• Show all work, clearly and in order, if you want to get full credit. I reserve the right to take off points if I cannot see how you arrived at your answer (even if your final answer is correct).

• Circle or otherwise indicate your final answers.

• Please keep your written answers brief; be clear and to the point. I will take points off for rambling and for incorrect or irrelevant statements.

• This test has 10 problems and is worth 60 points, plus some extra credit at the end. It is your responsibility to make sure that you have all of the pages!

• Good luck!
1. (6 points) Multiply, divide, add or subtract the following fractions. Then simplify. (e.g., \( \frac{\pi}{c} \times \frac{7}{\pi} = \frac{\pi \times 7}{c \times \pi} = \frac{7}{c} \)). Then give a decimal approximation in scientific notation. (e.g. \( \frac{7}{c} \approx 2.58 = 2.58 \times 10^0 \))
   a. (3 pts) \( \frac{1}{2} + \frac{12}{7} = \)

   b. (3 pts) \( \frac{24}{12} \div \frac{7}{5} = \)

2. (4 points) Please answer the following questions.
   a. (2 pts) When is it appropriate to divide by zero?

   b. (2 pts) Give the order of operations. (Hint: What do pigs eat?)

3. (5 points) Determine the truth of the premises, discuss the strength (weak, strong, etc.), and assess the truth of the conclusion.

   Premise: When we went to Coldstone you had chocolate ice cream
   Premise: When we went to Squirrel Bros. you had chocolate ice cream
   Premise: When we went to Baskin-Robins you had chocolate ice cream
   Conclusion: Whenever we go to an ice cream place you get chocolate ice cream.
4. (2 points) What kind of reasoning was used in the last question, inductive or deductive?

5. (4 points) The results of a survey of 50 people is given in the table below. They have been categorized as republican or democrat as well as pro life or pro choice. Use this table to construct a Venn Diagram. There are many ways to do this but full credit will only be given for the diagram with republicans in a circle and pro choice in another circle.

<table>
<thead>
<tr>
<th></th>
<th>Republicans</th>
<th>Democrats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pro life</td>
<td>23</td>
<td>5</td>
</tr>
<tr>
<td>Pro choice</td>
<td>2</td>
<td>20</td>
</tr>
</tbody>
</table>

6. (5 points) Analyze the following argument. Are the premises true? Is this argument valid? Is it sound? Is the conclusion true? Feel free to draw diagrams if you would like.

Premise: All salty foods cause high blood pressure.
Premise: Apples do not cause high blood pressure.
Conclusion: Apples are not salty foods.
7. (12 points) Convert the following. (For some you will need the conversion table)

\[
\begin{array}{c|c}
1yd & 3 ft \\
1mi & 5680 ft \\
1in & 2.45 cm \\
1lb & 0.4356 kg \\
1m & 1.094yd \\
1mL & 1cm^3 (1c.c.)
\end{array}
\]

a. (4 pts) Convert 20km/hr into m/hr.

b. (4 pts) Convert 1L into \( \text{in}^3 \).

c. (4 pts) Convert 25\(^\circ\)C to K.

8. (4 points) Calculate the following. State the answer in scientific notation. Then, give the order of magnitude.

\((-8.0 \times 10^{-2}) + (-2 \times 10^{-2})\)
9. (10 points) A curved bridge rises over a river. The two endpoints of the bridge are 1200 m apart (horizontally). You walk across the bridge with a device to measure its length, and you discover that the walking distance is 1202 m. Approximately how high does the bridge rise over the river.

   a. (2 pts) Draw a picture of this problem or describe what it is asking you to do.

   b. (3 pts) Devise a plan to solve the problem as you understand it.

   c. (4 pts) Carry out your plan. (Try to solve this problem.)

   d. (1 pt) Does your answer make sense? Why or why not?
10. (8 points) This test has 60 points and counts for 15\% of your grade. There are 8 quizzes and each is worth 25 points. Together the quizzes count for 20\% of your grade. We will call 1\% of your grade a class point. So, for example, this test is worth 15 class points.

   a. (2 pts) Find the value of 1 point from a quiz in class points.

   b. (2 pts) Find the value of 1 point on this test in class points.

   c. (2 pts) Find the absolute difference of the answers from part a. and b. with a. as the reference (absolute difference with with the value of a point from the quiz as the reference value). Be sure to specify the correct units.

   d. (2 pts) Find the relative difference of the answers from part a. and b. with a. as the reference(relative difference with with the value of a point from the quiz as the reference value).
Bonus Question (1 Extra Credit Points): Jill weighs 100% less than Jack. How much does Jill weigh?

Bonus Question (1 Extra Credit Points): Take the formulae for temperature conversion and create a formula to convert from Kelvin to Fahrenheit.