MTH 352 - EXAM 1 **Name:**_____

Instructions:

You must show ALL your work in ALL questions. You will be graded on your methods, not just your answers. Use only the space provided for each question. Any usage of calculators is prohibited during the exam.

You will have EXACTLY 50 minutes for the exam, which consists of problems numbered 1 – 9. Request a new copy of the exam if any of the problems are missing or hard to read.

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1) Fill in the blanks using the correct terminology in their full form:

a) *(4 points)* The two special cases of the any-order property are:
the _____ property and the _____ property.

b) *(4 points)* In the division problem $20 \div 4 = 5$,
the number 20 is called the _____ , the number 5 is called the _____ .

c) *(3 points)* The counting down method of subtraction relies on children's understanding of the
_____ interpretation of subtraction.

d) *(2 points)* The number "three hundred fourty two" in Egyptian numerals is _____.

e) *(1 point)* Multiplication of whole numbers is defined as _____ .

f) *(1 point)* Division is defined from multiplication using the concept of _____ .

g) *(1 point)* Convert to Expanded Form: 2731 = _____ .

h) *(1 point)* When $186 \div 6$ is presented as finding the number of 6s contained in
186, one is using the _____ interpretation of division.

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2) *(1 point each)* State the name of the arithmetic property or thinking strategy being used:

a) $243 \times 1 = 243$ _____

b) $(45 \times 23) \times 6 = 45 \times (23 \times 6)$ _____

c) $242 \times 5 = 141 \times 5$ _____

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3) *(3 points each)* Show (*clearly* but *briefly*) how to compute the following using Mental Math. Write down the *intermediate steps*, and state the *properties/techniques* used.

a) Use "counting-up" to find $431 - 296 =$

b) $89 \times 9 =$

c) $1430 \div 5 =$

d) $25 \times 68 =$

e) Use compensation to find $1234 - 789 =$

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4) *(5 points each)* Illustrate the following calculations using chip diagrams:

a) $274 + 145 =$

b) $301 - 172 =$

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5) *(5 points)* Using 2 or 3 sentences or bullet points, clearly and completely explain why $7 \div 0$ is undefined.

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6) *(5 points)* Illustrate $4+3=3+4$ using a measurement model. Include labels indicating both sides of the equality.

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7) *(10 points each)* Give ***Teacher Solutions with Diagrams*** for the following word problems.
Remember such a solution includes clear diagrams with complete labels,
question marks marking unknowns, brief computations using units, answer statements.

a) There are 9 red balloons. There are 3 times as many blue balloons as red balloons. How many balloons are there altogether?

b) John is 15kg heavier than Peter. Their total weight is 127kg. Find John's weight.

b) Harry bought 155 oranges for $35. He found that 15 of them were rotten. He sold all the remaining oranges at 7 for $2. How much money did he make?

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8) *(6 points)* Identify whether the following problems are measurement or partitive division by labeling with a circled M or P. **Do Not Solve Them!!!**

a) Jane poured 4 cups of mike equally into 7 glasses. How much was in each glass?

b) If the $36 cost of dinner is split equally among 8 people, how much does each pay?

c) If each serving of yogurt requires ½ cup of mik, how many servings will 7 cups of milk make?

d) Mrs. Wang's class as 33 pupils. When they divide into groups of 3, how many groups are there?

e) 4 children bought a present for $28, sharing the cost equally. How much did each pay?

f) There are 5280 feet in a mile. How many feet are there in one tenth of a mile?

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9) a) *(1 point)* In the decimal system, "place value" refers to the fact that

_____ .

a) *(4 points)* Write down the steps of the place value process in their full form.

b) *(2 points)* Using 2-digit numbers, give an example of an addition which does not use *step (ii)*.

c) *(2 points)* Using 2-digit numbers, give an example of an addition which uses *step (ii)*.

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