Math4010 Midterm 2 Jeopardy Review Key

Arithmetic

For each problem, use two different methods to show each of the computations.

10 points-- $145_7 \cdot 63_7$ is 13521_7

20 points-- $1001111_2 + 111001_2 = 10001000_2$

30 points-- $735_8 \div 6_8 = 117_8 \, R \, 3_8$ (Use one partitive and one measurement model.)

40 points-- $201_3 - 122_3 = 2_3$

50 points-- $331_4 + 230_4 = 1221_4$

60 points-- $441_5 \cdot 4_5 = 3414_5$

70 points-- $532_6 \div 41_6 = 12_6$ (Use one partitive and one measurement model.)

80 points-- $2345_9 - 1867_9 = 367_9$

GCF/LCM

For each problem, use two different methods to find both the GCF and LCM of the given numbers. (You can leave answers in factored form, if you'd like.)

10 points-- 36, 1470 GCF = 6, LCM = 8820

20 points-- 462, 180   GCF = 6, LCM = 13860

30 points-- 225, 154   GCF = 1, LCM = 34650

40 points-- 270, 210, 630   GCF = 30, LCM = 1890

50 points-- 45, 60, 66   GCF = 3, LCM = 1980

Properties

10 points-- Rewrite these expressions as a single exponent expression.
(a) $7^{12} \cdot 2^{12} \cdot 14^5 = 14^{17}$
(b) $4^5 \div 2^8 = 2^2$ or 4

20 points-- How many factors does the number $2^3 \cdot 3 \cdot 7 \cdot 11^2$ have? 48

30 points-- Identify the property of whole numbers being used in these examples.
     (a) $(3+2) \cdot 1 = 3+2$ multiplicative identity
     (b) $(4+7)+8 = 4+(7+8)$ associativity of addition
     (c) $(a-b)c = ac - bc$ distributive property
  (d) $(5 \cdot 3)7 = (3 \cdot 5)7$ commutativity of multiplication

40 points—Using the following table that defines the operator * on the set {X, Y, z}, answer the questions.

*	X	Y	Z
X	Y	Y	X
Y	A	Z	Y
Z	X	Y	Z

(a) Is the set closed under the operator *? *no because A shows up in the table when it wasn't in the original set*
(b) Is there an identity element? If so, what is it? *Yes, it's Z.*
(c) Is the operator commutative?   *No, because X * Y = Y but Y * X = A.*
  (d) Find Y*Z. *Y * Z = Y*

50 points-- If each different letter represents a different digit, find the number "HE" such that $(HE)^2 = SHE$. HE = 25

True/False
For each problem, determine if the statement is true or false. If it's false, explain why.
10 points-- Subtraction of whole numbers is commutative.   FALSE (5-3 not the same as 3 -5)

20 points-- Every prime number is odd.   FALSE (2 is also prime and it's even)

30 points-- The number 12 is a multiple of 36.   FALSE (12 is a factor of 36, not a multiple.)

40 points-- $(3^4)^2=3^{(4^2)}$ FALSE $(3^4)^2=3^8\neq 3^{(4^2)}=3^{16}$

50 points—There is only one right way for students to perform all the arithmetic operations, namely the standard algorithm.   FALSE—there are many ways for students to do all the arithmetic operations!

60 points—If $a\neq b$, then $GCF(a,b)<LCM(a,b)$.   TRUE

Hodge Podge
10 points-- Do these computations, or explain why they cannot be done.
(a) $0\div 5=0$
(b) $3\div 0$ undefined because we can't divide by zero-there are no answers
(c) $0\div 0$ undefined because we can't divide by zero--there are infinitely many answers

20 points-- Calculate the following problems mentally (but write down your steps).
(a) 17 x 99 = 1683
(b) 17 (6) – (6) 7 = 60
(c) 81 – 39 = 42

30 points-- Suppose a student said that the sum of the digits of the number 354 is 12 and therefore 354 is divisible by any number that divides into 12, like 2, 3, 4 and 6. Would you agree with the student? Explain. *No. This type of divisibility test only works for factors of 3 and 9. Using the above example, we can see that 4 does not go into 354 evenly.*

40 points-- Explain the difference between the wording "divided by," "divided into," and "divides." *20 divided by 5 means we're dividing 20 things into 5 groups (or groups of 5) so 20 divided by 5 is 4. 20 divided into 5 means "how many 20s are there in 5?" This would yield a fraction or decimal answer of 0.25. And, 20 divides 5 asks states that 20 goes into 5 evenly, which it doesn't. However, 5 divides 20 would be a true statement.*

50 points-- When Joe sorts his marbles, he notices that if he puts them into groups of 5, he has 1 left over. When he puts them into groups of 7, he also has 1 left over, but in groups of size 6, he has none left over. What is the smallest number of marbles that he could have?   36

60 points—Three neighborhood dogs barked consistently last night. Spot, Patches, and Lady began with a simultaneous bark at 11 p.m. Then, Spot barked every 4 minutes, Patches every 3 minutes and Lady every 5 minutes. When did Mr. Jones suddenly awaken from the loud sound of all three dogs barking together? *midnight*