First name: _____ Last name: _____ Student ID: _____

Calculations and Counting Homework

Basic problems

1. Use the Distributive Property to find each product.

1. $(2 \times 20) + (2 \times 7)$	2. $7 \times (30 + 1)$	3. $5 \times (70 + 5)$

2. Fill in the missing <u>operations</u>.

1. $8 \square 3 \square 47 = 149$ Use the operations: + and ×
2. $71 \square 84 \square 7 = 852$ Use the operations: × and ÷
3. $(54 \square 23) \square (47 \square 30) = 1{,}225$ Use the operations: ×, -, and -
4. $(9 \square 5 \square 23 \square 51) = 1{,}218$ Use the operations: +, ×, and ×

3. Complete.

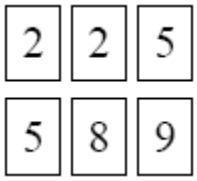
1. 306 × (-310) - (-329) + 23	2. 538 + 327 - (-439)
3. -85 x (-6) - (-450)	4. 446 + (136 - 52 ÷ 4 + 329)
5. 26 + (-65) ÷ 5 + 11 × (-47)	6. -4444 ÷ (-11) - (-449)

Challenge problems:

1. In the 4 × 4 square shown, each row, column and diagonal should contain each of the numbers 1, 2, 3, and 4. Find the value of $K+N$.

1	F	G	H
T	2	J	K
L	M	3	N
P	Q	1	R

2. The integers 2, 2, 5, 5, 8, and 9 are written on six cards, as shown. Any number of the six cards is chosen, and the sum of the integers on these cards is determined. Note that the integers 1 and 30 cannot be obtained as sums in this way. How many of the integers from 1 to 31 cannot be obtained as sums?



3. A triangle can be formed having side lengths 4, 5 and 8. It is impossible, however, to construct a triangle with side lengths 4, 5 and 9. Ron has eight sticks, each having an integer length. He observes that he cannot form a triangle using any three of these sticks as side lengths. What is the shortest possible length of the longest of the eight sticks?

4. Emily has created a jumping game using a straight row of floor tiles that she has numbered 1, 2, 3, 4, … . Starting on tile 2, she jumps along the row, landing on every second tile, and stops on the second last tile in the row. Starting from this tile, she turns and jumps back toward the start, this time landing on every third tile. She stops on tile 1. Finally, she turns again and jumps along the row, landing on every fifth tile. This time, she again stops on the second last tile. What is the number of tiles in the row?

a) 39 b) 40 c) 47 d) 49 e) 53

5. George wrote seven tests and each was marked out of 100. No two of his marks were the same. He recorded the seven marks to do a statistical analysis. He accidentally recorded his highest mark *higher* than it actually was. How many of the following are altered because of his mistake?

• Mean • Median • Minimum test score • Range

6. There are 13 trees on one side of the street on Trina's way from her house to school. Today, on her way to school, Trina put a chalk mark on every other tree, starting with the first she passed. When she goes home from school, she will put a chalk mark on every third tree, again starting with the first one she passes. By the time Trina arrives at home, how many of the 13 trees will *not* have a chalk mark on them?

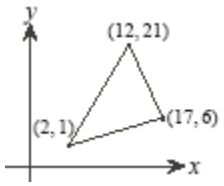
7. Chloe has made a code out of the alphabet by assigning a numerical value to each letter. She then assigns a numerical value to a word by adding up the numerical values of the letters in the word. Using her code, the numerical value of BAT is 6. Also, her code gives numerical values of 8 to CAT and 12 to CAR. Using her code, what is the numerical value of BAR?

8. Pete is given three positive integers and is told to add the first two, and then multiply the result by the third. Instead, he multiplies the first two and adds the third to that result. Surprisingly, he still gets the correct answer of 14. How many different values could the first number have been?

9. In the diagram, the numbers from 1 to 25 are to be arranged in the 5 by 5 grid so that each number, except 1 and 2, is the sum of two of its neighbours. (Numbers in the grid are neighbours if their squares touch along a side or at a corner. For example, the "1" has 8 neighbours.)
Some of the numbers have already been filled in. Which number must replace the "?" when the grid is completed?

			20	21
	6	5	4	
23	7	1	3	?
	9	8	2	
25	24			22

10. A lattice point is a point (x, y), with x and y both integers. For example, (2, 3) is a lattice point but (4, 1/3) is not. In the diagram, how many lattice points lie on the perimeter of the triangle?



11. A 3 × 3 grid is filled with the digits 1, 2 and 3 so that each number appears once in each row and column. Two different examples are

1	2	3
3	1	2
2	3	1

and

3	2	1
2	1	3
1	3	2

. How many different ways are there of filling the grid?