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

Operations and Calculations Homework

Basic problems

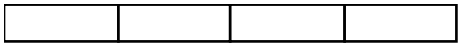
1. Evaluate to a single number.

1. $5^0 + 8^3$	2. $2^3 + 7^4$

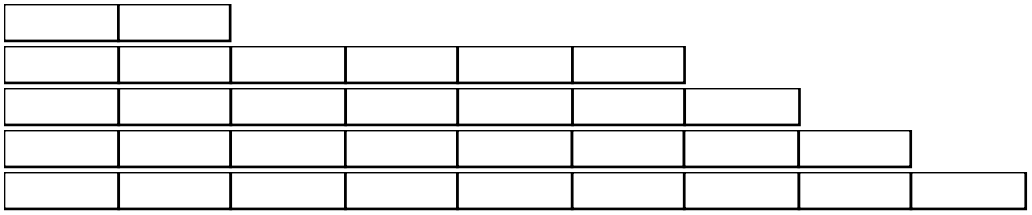
2. Simplify.

1. $(-4x) \div (-9x)^3$	2. $(32x)^2 \div (22x)^0$
3. $(-9h^3q^6)(-5h^5)$	4. $(-m^4)(12m^3n^5)$
5. $7^{12} \times 7^{-3} \times 7^{-10}$	6. $(6^{-12})\ (6^{-8})\ (6^{-7})$
7. $(13x)^4 \div (-27x)^2$	8. $(14x) \div (-31x)^0$
9. $(-5x)^3 \div (-27x)^3$	10. $(-18x)^2 \div (18x)^4$

Challenge problems:

1. 

If the fraction strip shown here represents 2/3, which fraction strip represents 3/2?



2. The figure shown here represents $\frac{3}{2}$. Which of the choices would represent 2? (This means two 1's, not two $\frac{3}{2}$'s.) 

a. 

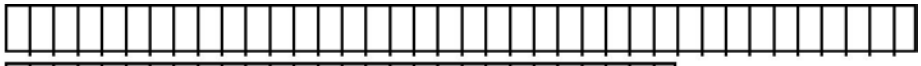
b. 

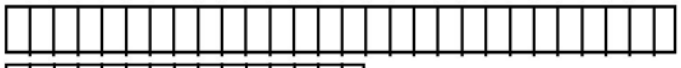
c. 

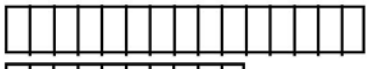
d. 

e. 

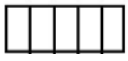
3. If the figure below represents $3\frac{3}{4}$, which of the choices would represent $\frac{5}{6}$ of 1(NOT $\frac{5}{6}$ of $3\frac{3}{4}$)?

a. 

b. 

c. 

d. 

e. 

4. A calculator displays 5.1698788285E+58 when 25^{42} is entered. Which statement is true?

a. The answer displayed is not exact.
b. The answer to 25^{42} would have 58 zeros at the end, if the calculator had a big enough display.
c. the answer to 25^{42} would have 48 zeros at the end, if the calculator had a big enough display
d. The answer to 25^{42}would have 47 zeros at the end, if the calculator had a big enough display.
e. The answer to 25^{42}would have 49 zeros at the end, if the calculator had a big enough display.

5. Ann, Ben, Coy, Don, and Ella ride these buses: 4, 15, 18, 27, and 30 (not necessarily in that order). They all forgot their bus numbers. Each did remember something about his or her bus number:

- Ann knows her bus number has a 1 in it.
- Ben knows that his bus number is divisible by 3.
- Coy knows that the sum of the digits in his bus number is 9 and that his bus number is greater than Ben's.
- Don knows his bus is yellow.
- Ella knows that her bus number is twice that of Ann's.

Which statement is true?

a. Ann rides bus 15. b. Ben rides bus 30. c. Coy rides bus 18. d. Don rides 27.
e. Ella rides bus 4.

6. The least common multiple of two numbers is 120. Neither number is 120. Neither number is 1. Which statement CANNOT be true about the two numbers?
a. One number is a multiple of 9.
b. One number is a multiple of five and the other is not.
c. One number has a factor of 8.
d. Both numbers are even.
e. Both numbers are multiples of 5.

7. The first 6 rows of Pascal's Triangle are shown here. What would be the third number (from the left) in the 20th row?

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1

8. When Lynn mentally calculated 36 x 25, Lynn thought of it as (9 x 4) x 25. Then Lynn thought about 9 x (4 x 25) = 900. Which property of multiplication did Lynn use?

a. Associative Property b. Commutative Property c. Distributive Property
d. Identity Property e. Property of Multiplication by Zero

9. The prime factorization of 12 has three factors: $2 \cdot 2 \cdot 3$. If the prime factorization of a has 15 factors and the prime factorization of b has 18 factors, how many factors are in the prime factorization of ab?

10. Melissa and Craig were doing their math homework. They had a disagreement on one of the problems. The problem read, "What is the value of $(4)(2^{1996})$? Melissa found it to be (8^{1996}), but Craig disagreed and felt it was (2^{1998}). Were either of them right? If so, who was right?

11. When $10^{93}-93$ is expressed as a single whole number, what is the sum of its digits?

12. The sum of 3 consecutive counting numbers is one-eighth of their product. What is their product?

13. What is the value of $1 - 3 + 5 - 7 + 9 \ldots - 99$? (Note that subtraction and addition are alternating in the sequence of odd numbers.)

14. Calculate $\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{3\frac{1}{3}}}}$.