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

Algebra Homework

Basic problems

1. **Solve each equation.**

1. $36 = r - 50$	2. $17 - s = 12$	3. $g - 89 = 9$
4. $18 = 54 - 2u$	5. $90 - 10y = 34$	6. $4m - 55 = 13$
7. $18 = 3(3x - 6)$	8. $30 = -5(6z + 6)$	9. $8 = 8v - 4(v + 8)$

2. **Complete by evaluating each expression.**

1. $n - 2 + 29$ for $n=9$	2. $9 \times (n \div 7)$ for $n=49$	3. $(n + 1)^2 - (n - 22)$ for $n=1$
4. $n^3 \div 3 - n$ for $n=3$	5. $12n - n^2$ for $n=2$	6. $2n^2 \div 4$ for $n=5$

3. Translate the following words into algebraic equations or expressions.

1. A number plus 69 is 163.	2. The square of five more than a number is 100.
3. A number divided by 6 is 2.	4. A number multiplied by 12 increased by 11.
5. Five times the sum of a number and two.	6. The sum of the squares of two consecutive integers. The smaller number is x.

4. Combine like terms.

1. $10n + 15n^2 - 13 + 6n + 3n^2 + 2$	2. $7r^2 + r + 5r - 9r^2 + 7 + 10r + 13$
3. $8a + 2a^4 - 3a^2 + 19a^4 - 5a$	4. $6m + 10m^4 - 13m^4$
5. $n^2 + 12n + 18 - 11n + 17 - 4n^2$	6. $6z - 16z - 9z + 18z + 2$
7. $7c^2 + 4 - 8c^2 - 12c - 1 - 17c^2 - 15c$	8. $14b + 19b^2 - 11 - 12b - 9b^2$

5. Solve each inequality.

1. $p - 4.3 \leq 24.7$	2. $6 \leq 17 + y$	3. $16.9 + m \geq 4.5$

4. $18 > n + 19$	5. $27 > 15 - b$	6. $a + (-10.3) \geq -20.2$
7. $t + (-2) > 12$	8. $22.6 < x - 30.2$	9. $-2 - s \leq 29$
10. $q + 3 \geq 7$	11. $20 \leq s - 14$	12. $6 \leq e - 16$

Challenge problems

1. Many calculators have a reciprocal key $[\frac{1}{x}]$ that replaces the current number displayed with its reciprocal. For example, if the display is [4] and the key $[\frac{1}{x}]$ is pressed, then the display becomes [0.25]. If [32] is currently displayed, what is the fewest number of times you must press the $[\frac{1}{x}]$ key so the display again reads [32]?

*Only Algebraic Way is allowed to solve the following problems. Remember to have a "Let" Statement.

2. 735 exceeds twelve times a number by 87. What is the number?

3. The five tires of a car (four road tires and a full−sized spare) were rotated so that each tire was used the same number of miles during the first 30,000 miles the car traveled. For how many miles was each tire used?

4. Two children at a time can play pairball. For 90 minutes, with only two children playing at one time, five children take turns so that each one plays the same amount of time. What is the number of minutes each child plays?

5. A teacher tells the class, "Think of a number, add 1 to it, and double the result. Give the answer to your partner. Partner, subtract 1 from the number you are given and double the result to get your answer."
a) If Ben thinks of x, and gives his answer to Sue. What should Sue's answer be? Remember to simplify the expression.

b) If Ben thinks of 6, what is Sue's answer?

6. Walter gets up at 6:30 a.m., catches the school bus at 7:30 am., has 6 classes that last 50 minutes each, has 30 minutes for lunch, and has 2 hours additional time at school. He takes the bus home and arrives at 4:00 p.m. How many minutes has he spent on the bus?

7. Judy would buy some juice. She found that the cost of 8 large bottles were same as that of 10 small bottles. If each small bottle of juice was ¢50 cheaper than that of large bottle, find the price of small bottle of juice.

8. The average of the five numbers in a list is 54. The average of the first two numbers is 48. What is the average of the last three numbers?

9. Niki usually leaves her cell phone on. If her cell phone is on but she is not actually using it, the battery will last for 24 hours. If she is using it constantly, the battery will last for only 3 hours. Since the last recharge, her phone has been on 9 hours, and during that time she has used it for 60 minutes. If she doesn't talk any more but leaves the phone on, how many more hours will the battery last?

10. Fifty two students in a class plant trees, every guy plants 3 trees and every girl plants 2 trees. We know the guys planted 36 more trees than the girls, how many guys are there in this class?