Lesson Summary

A *linear expression* is an expression that is equivalent to the sum or difference of one or more expressions where each expression is either a number, a variable, or a product of a number and a variable.

A linear expression in x can be represented by terms whose variable x is raised to either a power of 0 or 1. For example, $4 + 3x$, $7x + x - 15$, and $\frac{1}{2}x + 7 - 2$ are all linear expressions in x. A nonlinear expression in x has terms where x is raised to a power that is not 0 or 1. For example, $2x^2 - 9$, $-6x^{-3} + 8 + x$, and $\frac{1}{x} + 8$ are all nonlinear expressions in x.

Problem Set

Write each of the following statements as a mathematical expression. State whether the expression is linear or nonlinear. If it is nonlinear, then explain why.

1. A number decreased by three squared
2. The quotient of two and a number, subtracted from seventeen
3. The sum of thirteen and twice a number
4. 5.2 more than the product of seven and a number
5. The sum that represents the number of tickets sold if 35 tickets were sold Monday, half of the remaining tickets were sold on Tuesday, and 14 tickets were sold on Wednesday
6. The product of 19 and a number, subtracted from the reciprocal of the number cubed
7. The product of 15 and a number, and then the product multiplied by itself four times
8. A number increased by five and then divided by two
9. Eight times the result of subtracting three from a number
10. The sum of twice a number and four times a number subtracted from the number squared
11. One-third of the result of three times a number that is increased by 12

12. Five times the sum of one-half and a number

13. Three-fourths of a number multiplied by seven

14. The sum of a number and negative three, multiplied by the number

15. The square of the difference between a number and 10