

Name: _____
Algebra 1

Date: _____
Band: _____

Foundations of Algebra Study Guide

LT#1: Simplify expressions involving exponents.

Simplify each expression.

- 9^2
- 5^3
- $\left(\frac{1}{6}\right)^2$
- $7^2 \div 5$
- $(2^4 - 6)^2$
- $(3^3 - 4) + 5^2$
- A car travels at 205 mi/h. How far does the car travel in 3h?

LT#2: Use order of operations to evaluate expressions.

- A student studies with a tutor for 1 hour each week and studies alone for h hours each week. What is an expression for the total hours spent studying each week? Evaluate the expression for $h = 5$.

Evaluate each expression for $c = 3$ and $d = 5$.

- $d^3 \div 15$
- $(2 + d)^2 - 3^2$
- $cd^2 + 4$
- $(3c^2 - 3d)^2 - 21$

LT#3: Classify, graph, and compare real numbers.

Tell whether each number is rational or irrational.

- -5.422
- $\sqrt{7}$
- π
- $-\frac{1}{2}$
- $\sqrt{\frac{2}{3}}$
- $0.\overline{57}$

Name the subset(s) of the real numbers to which each number belongs.

- -17
- $\frac{13}{62}$
- $\sqrt{94}$
- $\sqrt{100}$
- 4.288

12. $1\frac{2}{3}$

Order the numbers in each from least to greatest.

13. $-1\frac{2}{3}, 1.6, -1\frac{4}{5}$

14. $\frac{7}{9}, -0.8, \sqrt{3}$

LT#4: Identify and use properties of real numbers.

13. Use an identity property to simplify $-\frac{7ab}{a}$.

Simplify each expression.

14. $-8 + 9w + (-23)$

15. $\frac{6}{5} \cdot (-10 \cdot 8)$

16. $\left(\frac{4}{3} \cdot 0\right) \cdot (-20)$

17. $53 + (-12) + (-4t)$

18. $\frac{6+3}{9}$

Tell whether the expression in each pair are equivalent.

19. $(5 - 2)c$ and $c \cdot 3$

20. $41 + z + 9$ and $41 \cdot z \cdot 9$

21. $\frac{81xy}{3x}$ and $9xy$

22. $\frac{11t}{(5+7-11)}$ and t

LT#5: Find sums and differences of real numbers.

23. Cave explorers descend to a site that has an elevation of -1.3 km. (Negative elevation means below sea level). The explorers descend another 0.6 km before they stop to rest. What the elevation at their resting point?

Find each sum. (You may use a number line.)

24. $1 + 4$

25. $3 + (-8)$

26. $= 2 + (-7)$

Simplify each expression.

27. $-5.6 + 7.4$

28. $-13 + (-6)$

29. $-9 - (-12)$

Evaluate each expression for $p = 5$ and $q = -3$.

30. $-3q + 7$

31. $q - 8$

32. $5p - 6$
 33. $7q - 7p$

LT#6: Find products and quotients of real numbers.

Simplify each expression.

34. -12^2
 35. $-5(-8)$
 36. $4.5 \div (-1.5)$
 37. $(-2)(-2)(-2)$
 38. $-54 \div (-0.9)$

Evaluate each expression or $p = 5$ and $q = -3$.

39. $-(4q)$
 40. $-(2p)^2$
 41. $(pq)^2$
 42. $2q \div 4p$

LT#7: Use the Distributive Property to simplify expressions.

43. Simplify $7t + (3 - 4t)$

Simplify each expression.

44. $5(2x - 3)$
 45. $-2(7 - a)$
 46. $(-j + 8)\frac{1}{2}$
 47. $3v^2 - 2v^2$
 48. $2(3y - 3)$
 49. $(6y - 1)\frac{1}{4}$
 50. $(24 - 24y)\frac{1}{4}$
 51. $6y - 3 - 5y$
 52. $\frac{1}{3}y + 6 - \frac{2}{3}y$
 53. $-ab^2 - ab^2$

54. All 95 members of the jazz club pay \$30 each to go see a jazz performance. What is the total cost of tickets? Use mental math.

55. Are $8x^2y$ and $-5yx^2$ like terms? Explain.