Name:_____ Date:_____
Algebra Band:_____

Solving Equations Study Guide

LT#1: Solve one-step equations in one variable.

1. What is the solution of $\frac{y}{2} + 5 = 8$?

Solve each equation. Check your answer.

2. $x + 5 = -2$
3. $a - 2.5 = 4.5$
4. $3b = 42$
5. $\frac{n}{5} = 13$

6. Five friends equally split a restaurant bull that comes to $32.50. How much does each pay?

LT#2: Solve two-step equations in one variable.

Solve each equation. Check your answer.

1. $7x - 2 = 22.5$
2. $\frac{y}{4} - 3 = -4$
3. $8 + 3m = -7$
4. $-\frac{3d}{4} + 5 = 11$

LT#3: Solve multi-step equations in one variable.

1. What is the solution of $12 = 2x + \frac{4}{3} - \frac{2x}{3}$?

Solve each equation. Check your answer.

2. $7(s - 5) = 42$
3. $3a + 2 - 5a = -14$
4. $-4b - 5 + 2b = 10$
5. $3.4t + 0.08 = 11$
6. $10 = \frac{c}{3} - 4 + \frac{c}{6}$
7. $\frac{2x}{7} + \frac{4}{5} = 5$

Write an equation to model each situation. Then solve the equation.

8. You work for 4 h on Saturday and 8 h on Sunday. You also receive a $50 bonus. You earn $164. How much did you earn per hour?

9. Online concert tickets cost $37 each, plus a service charge of $8.50 per ticket. The Web site also charges transaction fee of $14.99 for the purchase. You paid $242.49. How many tickets did you buy?

LT#4: Solve equations with variables on both sides.
LT#5: Identify equations that are identities or have no solution.

1. What is the solution of $3x - 7 = 5x + 19$?

Solve each equation. If the equation is an identity, write *identity*. If it has no solution, write *no solution.*

2. $\frac{2}{3}x + 4 = \frac{3}{5}x - 2$
3. $6 - 0.25f = f - 3$
4. $3(h - 4) = -\frac{1}{2}(24 - 6h)$
5. $5n = 20(4 + 0.25n)$

6. Two buildings have the same total height. One building has 8 floors with height h. The other building has a ground floor of 16 ft and 6 other floors with height h. Write and solve an equation to find the height h of these floors.

7. A train makes a trip at 65 mi/h. A plane traveling 130 mi/h makes the same trip in 3 fewer hours. Write and solve an equation to find the distance of the trip.

LT#6: Rewrite and use literal equations and formulas.

1. What is width of a rectangle with area 91 ft^2 and length 7 ft?

Solve each equation for x.

2. $ax + bx = -c$
3. $\frac{x+r}{t} + 1 = 0$
4. $m - 3x = 2x + p$
5. $\frac{x}{p} + \frac{x}{q} = s$

Solve each problem. Round to the nearest tenth, if necessary.

6. What is the width of a rectangle with length 5.5 cm and area 220 cm^2?

7. What is the radius of a circle with circumference 94.2 mm?

8. A triangle has height 15 in. and area 120 in^2. What is the length of its base?

LT#7: Solve and apply proportions.

Solve each proportion.

1. $\frac{3}{7} = \frac{x}{9}$
2. $\frac{-8}{10} = \frac{y}{5}$
3. $\frac{6}{15} = \frac{a}{4}$
4. $\frac{3}{-7} = \frac{-9}{t}$

5. $\frac{b+3}{7} = \frac{b-3}{6}$
6. $\frac{5}{2c-3} = \frac{3}{7c+4}$

LT#8: Solve percent problems using proportions.
LT#9: Solve percent problems using the percent equation.

1. What percent of 84 is 105?
2. What percent of 37 is 111?
3. What is 72% of 150?
4. 60% of what number is 102?
5. A gardener expects that 75% of the seeds she plants will produce plants. She wants 45 plants. How many seeds should she plant?
6. A charity sent out 700 fundraising letters and received 210 contributions in response. What was the percent of response?
7. In a survey, 60% of students prefer bagels to donuts. If 120 students were surveyed, how many students prefer bagels?

LT#10: Find percent change.

1. A bookstore buys a book for $16 and marks it up to $28. What is the markup expressed as a percent change?

Tell whether each percent change is an increase or decrease. Then find the percent change. Round to the nearest percent.

2. Original amount: 27
   New amount: 30

3. Original amount: 250
   New amount: 200

4. Original amount: 873
   New amount: 781

5. Original amount: 4.7
   New amount: 6.2

6. In 1970, the U.S. population was about 205 million people. In 2007, it was about 301 million. What was the percent increase?

7. The time from sunrise to sunset on the shortest day of the year in Jacksonville, Florida, is about 10 h 11 min. On the longest day, the time is 14 h 7 min. What is the percent increase?

8. This morning the temperature was $38°\text{F}$. This afternoon it is $57°\text{F}$. Did the temperature increase by 50%? Explain.