

Name: _____

Key Study Guide

UNIT #2 Study Guide
Algebra I

Study Guide

PART I QUESTIONS: Answer all questions in this part by writing the choice of the appropriate answer in the blank beside the problem. Please show all of your work.

1. Which of the following values of x is a solution to the equation

$$4(x-3) + 8 = 68$$

Distribute

$$4x - 12 + 8 = 68$$

CLT

$$4x - 4 = 68$$

Addition

$$4x = 72$$

Division

$$x = 18$$

2. Solve the two step equation $\frac{x}{-4} + 5 = -7$

$$\frac{x}{-4} - 5 = -7$$

subtract opposite of add

$$\frac{x}{-4} = -12$$

$$(-4) \cdot (-4) \cdot \frac{x}{-4} = (-4) \cdot (-12)$$

multiply opposite of divide

$$x = 48$$

3. Write a true inequality when $x = -2$.

$$x < -1$$

$$x \leq -2 \quad \text{OR} \quad x \leq -1$$

$$x > -3$$

$$x \geq -2 \quad \text{OR} \quad x \geq -3$$

4. Two times the sum of a number, n , and 4 is at most 20. Which of the following inequalities properly models this statement? Write this statement.

$$2(n+4) \leq 20$$

↑ times Sum of n and 4

at most OR

< means less than

> means greater than

≤ means less than or equal to

≥ means greater than or equal to

Answers

Key Unit 2 SG

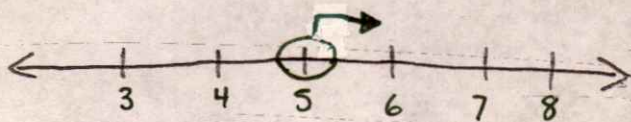
5. Max correctly starts solving the linear equation $3(x+7) = -9$ writing $x+7 = -3$ Which of the following properties justifies what Max wrote?

$$\div 3 \quad \div 3$$

$$x+7 = -3$$

Max did division

6. Which of the following graphs shows the solution set to $3x - 7 > 8$
Graph the solution



$$\text{addition } +7 \quad +7$$

$$3x > 15$$

$$\text{division } \div 3 \quad \div 3$$

$$x > 5$$

open circle
OR

Closed circle

why?

greater than OR less than

not equal to five

7. The value $x=8$ is a solution to each of the following, except which?

$$x - 4 > 3x \quad \text{OR}$$

$$2(x+3) = 4x - 10$$

$$(8) - 4 > 3(8)$$

$$2(8+3) = 4(8) - 10$$

$$4 > 24$$

$$2(11) = 32 - 10$$

$$22 = 22$$

No, False, Not a solution

Yes, True, it is a solution

8. Plato was saving \$10 each week in order to have enough money for a phone that costs \$150. If his father started him off with \$20 which of the following is the minimum number of whole weeks Plato will need to save? Write an equation and solve. Let $x =$ the minimum number of weeks

Plato needs to
save for 13 weeks.

$$10x + 20 = 150$$

$$-20 \quad -20 \quad \text{subtraction}$$

$$10x = 130$$

$$\div 10 \quad \div 10 \quad \text{Division}$$

$$x = 13$$

Key Answers

Unit 2 SG Algebra

PART II QUESTIONS: Answer all questions in this part. Please show all of your work.

9. The volume of a cone is given by the formula $V = \frac{1}{3} \pi r^2 h$. Solve this equation for the height, h in terms of V and r .

(3) (3) multiplication

$$3V = \pi r^2 h$$

$$\div \pi r^2 \quad \div \pi r^2 \quad \text{division}$$

$$\boxed{\frac{3V}{\pi r^2} = h} \leftarrow \text{solved for } h. \text{ It is by itself.}$$

10. When a number, x is increased by 4, and then the result is multiplied by 6 is equal to 18. Write an equation and solve it to find the value of x .

$$6(x+4) = 18$$

$$6x + 24 = 18$$

$$-24 \quad -24$$

$$6x = -6$$

$$\div 6 \quad \div 6$$

$$\boxed{x = -1}$$

equation \rightarrow $6(x+4) = 18$

$$\div 6 \quad \div 6 \quad \text{division}$$

$$x+4 = 3$$

$$-4 \quad -4 \quad \text{subtraction}$$

$$\boxed{x = -1}$$

11. Justify your response, is the value $x = -4$ a solution to the inequality $5x - 3 > 6x$

Substitution
problem

$$5(-4) - 3 > 6(-4)$$

$$-20 - 3 > -24$$

$$-23 > -24$$

Yes, True, it is a solution

12. Solve the following equation for x . Show the manipulations that lead to your final answer.

$$7(x+2) - 3x + 4 = (x-5) + (x-3)$$

only + or = in front

Distribute

$$7x + 14 - 3x + 4 = x - 5 + x - 3$$

CLT

$$4x + 18 = 2x - 8$$

$$-2x$$

$$-2x$$

Subtraction

$$2x + 18 = -8$$

$$-18$$

$$-18$$

Subtraction

$$2x = -26$$

$$\div 2$$

$$\div 2$$

$$\boxed{x = -13}$$

Division

13. Algebraically solve the inequality.

$$5x - 146 \leq -9/3x + 2$$

$$5x - 146 \leq -27x - 18$$

+27x +27x

addition

$$32x - 146 \leq -18$$

+146 +146

Addition

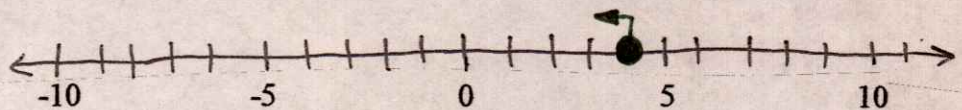
$$32x \leq 128$$

÷32 ÷32

Division

14. Graph the inequality from #13 on the number line.

$$x \leq 4$$

closed b/c equal to
left b/c less

15. Give a property of real numbers or a property of equality to justify each step in the solution of the equation shown below.

Commutative (changed order) Step 1

$$4x - 8 + 2x + 1 = -37$$

Combine Like terms (CLT) Step 2

$$4x + 2x - 8 + 1 = -37$$

Addition Postulate Step 3

$$6x - 7 = -37$$

Division Postulate Step 4

$$6x = -30$$

$$x = -5$$

16. Solve the following multistep equation. $-3x - 4 = -22$

$$-3x - 4 = -22$$

+4 +4 Addition

$$-3x = -18$$

$$\div -3 \div -3 Division$$

$$x = 6$$