

# Unit 4 Study Guide: Equations & Inequalities

## Vocabulary:

1. Equation\_\_\_: a statement that shows two mathematical expressions are equal
2. Inverse\_\_ \_Operations\_: pairs of operations that undo each other.

Addition and subtraction are inverse operations. For example,  $1 + 4 = 5$ , and  $5 - 4 = 1$ .  
Multiplication and division are inverse operations. For example,  $2 \times 3 = 6$ , and  $6 \div 3 = 2$ .

3. Solution\_\_\_: A number (or ordered pair of numbers, or set of numbers) that produces a true statement when substituted for the variable(s) in an equation or inequality.
  4. \_Inequality\_: A mathematical sentence that contains the symbols  $>$ ,  $<$ ,  $\geq$ , or  $\leq$ .
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## Part A: Solving & Writing One-Step Equations

- I have completed Section A and checked my answers on Weebly.  
 I can write and solve one-step equations, keeping the equation balanced at all times, with confidence.  
 I need help with understanding Section A.

5.  $X + 319 = 2084$

6.  $Y - 482 = 912$

7.  $2.5h = 80$

8.  $\frac{r}{3.2} = 20.1$

9.  $\frac{4}{5} + w = \frac{7}{8}$

10.  $2\frac{1}{4}a = 1\frac{1}{4}$

11.  $1.2y = -144$

12.  $\frac{n}{8.2} = -0.6$

13.  $-1.8 + v = -3.8$

14.  $-\frac{5}{26} + m = -\frac{7}{13}$

15.  $y - \frac{3}{4} = -\frac{9}{20}$

16.  $-\frac{8}{13}v = -\frac{6}{13}$

17. Martin spends \$85 a month on his cell phone plan. He has saved \$1,105. How many months,  $m$ , will Martin be able to pay for his cell phone plan?

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

18. Emily uses 3.5 cans of blue paint to paint her bedroom and,  $b$ , cans of blue paint to paint her kitchen. If she used 6.25 cans total, how much paint did she use to paint the kitchen?

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

19. Kyle is  $3\frac{1}{4}$  years younger than her brother Sam. She is  $4\frac{1}{2}$  years old. What is Sam's age,  $a$ ?

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

20. Julie wants to buy some fancy ribbon for an art project. The ribbon costs \$5 a yard. Julie spends \$2.25 on ribbon. How many yards,  $y$ , of ribbon did she buy?

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

21. A bakery makes 24 rolls (1 batch) at a time. They have made 32 batches of rolls, so how many rolls,  $r$ , have they baked in total.

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

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## Part B: Inequalities

- I have completed Section B and checked my answers on Weebly.
- I can write, solve, and graph one-step inequalities with confidence.
- I need help with understanding Section B.

Write an inequality for each situation.

22. The temperature today will be at most  $50^{\circ}$  F. \_\_\_\_\_

23. The temperature tomorrow will be above  $70^{\circ}$  F. \_\_\_\_\_

24. Yesterday, there was less than 2 inches of rain. \_\_\_\_\_

25. Last Monday, there was at least 3 inches of rain. \_\_\_\_\_

Solve each inequality. Then graph each solution set on a number line. You will have to label the number line with numbers.

26.  $s - 2 > 14$



27.  $c - 17 \leq -6$



28.  $-25 > y - 53$



29.  $k + 3.2 \geq 8$



30.  $c - 6\frac{1}{2} < -1\frac{1}{4}$



31.  $\frac{s}{5} > 1.4$



32.  $5z > -3$



33.  $\frac{m}{4} < -13$



34.  $\frac{2}{3}y \geq 12$



35.  $5.6v \geq -14$



Write an inequality for each word problem and then solve.

36. A pilot must log at least 1000 training hours to fly a jet aircraft. Tom had logged 250 hours. How many more hours must be logged in order to make the qualification?

Inequality: \_\_\_\_\_

Solution: \_\_\_\_\_

37. In order for a field trip to be scheduled, at least 30 students must sign up. So far, 23 students have signed up. At least how many more students must sign up in order for the field trip to be scheduled?

Inequality: \_\_\_\_\_

Solution: \_\_\_\_\_

38. It cost Sophia \$530 to make wind chimes. How many wind chimes must she sell at \$12 apiece to make a profit?

Inequality: \_\_\_\_\_

Solution: \_\_\_\_\_

39. Mrs. Fox charges \$3 for a pencil to students who forgot to bring one to class. If Sean was charged at least \$45 in one marking period, how many times did he forget his pencil?

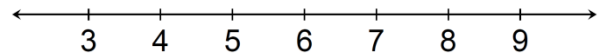
Inequality: \_\_\_\_\_

Solution: \_\_\_\_\_

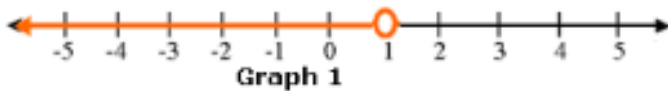
Write an inequality to represent the situation. Then, graph the solution.

40. Kasey has been mowing lawns to save up money for a concert. He earns \$15 per hour and needs at least \$90 to go to the concert. How many hours should he mow?

Inequality: \_\_\_\_\_

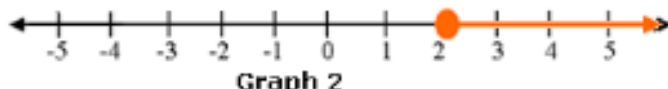


Write an inequality for each graph.



Graph 1

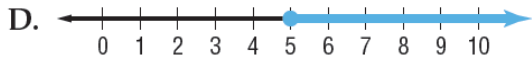
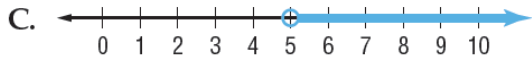
41. \_\_\_\_\_



Graph 2

42. \_\_\_\_\_

43. Which of the following graphs represent the inequality  $x \geq 5$ ?



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## Part C:

### Open-Ended

44. Justin can type  $w$  words per minute. Melvin can type 4 times as many words as Justin. Melvin types 60 words per minute. How many words can Justin type per minute?

45. Nolan recorded the number of hours,  $n$ , he spent reading over the summer for a library reading program.

Taylor read for twice as many hours as Nolan. If Taylor read for 54 hours, write an equation that can be used to find the number of hours Nolan read. Solve the equation to determine the number of hours Nolan read.

46. Jessica bought an 8-pound ham to serve at a party. She plans to serve each adult  $\frac{2}{5}$  pound.

### Part A

Write an equation to represent the number of adult servings,  $x$ , Jessica can get from the 8-pound ham. Use your equation to determine the number of adult servings in an 8-pound ham. Show your work.

### Part B

The children at the party will each receive  $\frac{5}{12}$  of an adult serving. Write and solve an equation to determine the number of children's servings,  $s$ , Jessica can get from the 8-pound ham. Show your work.

47. The band is trying to raise money for new uniforms by holding a car wash. Their goal is to raise \$1000. If they charge \$15 per wash, what is the minimum number of cars they must wash?

Write and solve an inequality that describes the minimum number of cars they must wash.

Inequality: \_\_\_\_\_

Solution Set: \_\_\_\_\_

