

Teachers: Kalis, Teixeira, Tober

Course: Algebra Readiness

Periods: all

Assignment: Week 4 – Solving Equations

Content Area & Materials	Learning Objectives	Tasks	Check-in Opportunities	Submission of Work for Grades
Algebra Readiness		<ul style="list-style-type: none"> • Paper Packet Option • Digital Option 		<ul style="list-style-type: none"> • Method: Scan, photo, email, or deliver
<p>PAPER PACKET</p> <ul style="list-style-type: none"> • Weekly Planner (this sheet) • Chapter 8 - Solving one-step equations (4 pages) <p>Digital Option</p> <ul style="list-style-type: none"> • Log on to your Khan Academy account at www.khanacademy.org • Complete the Khan Academy activities assigned by your teacher. 	<p>ESSENTIAL QUESTION: How do you solve one-step equations?</p> <p>STUDENTS WILL...</p> <ul style="list-style-type: none"> • Be able to solve an equation using addition and subtraction. • Be able to solve an equation using multiplication and division. 	<p>PAPER PACKET: If you picked up a paper packet you are expected to turn in the 4 pages in order to get credit for week 4. (per distance learning calendar, week 4 work is due May 15). You are also welcome to scan or take photos of your work and email them to your teacher. Be sure to show your work for every problem.</p> <p>ONLINE WORK: You are to complete the assigned Khan Academy activities by May 15.</p>	<p>OFFICE HOURS:</p> <p>Mrs. Teixeira Office Hours: Mon-Fri, 11am - 1pm Email: kteixeira@tusd.net</p> <p>Mr. Kalis: See calendar on Mr. Kalis' web-site: calkalis.com</p> <p>Mrs. Tober: Office Hours: Mon - Fri, 1pm - 3pm Email: jtober@tusd.net Google Voice #: 209) 597-8704</p>	<p>Students are expected to complete the paper packet or the digital option in order to receive full credit.</p> <p>IF SUBMITTING THE PAPER PACKET, LABEL WITH:</p> <ul style="list-style-type: none"> • Student Name (First and Last) • Teacher Name • Algebra Readiness • Period #: _____ <p>TO SUBMIT ELECTRONICALLY, simply email your teacher a scan or photos of your completed work.</p>

Chapter 8

Solving One-Step Equations

ONE-STEP ALGEBRA PROBLEMS WITH ADDITION AND SUBTRACTION

You have been solving algebra problems since second grade by filling in blanks. For example, $5 + \underline{\quad} = 8$. The answer is 3. You can solve the same kind of problems using algebra. The problems only look a little different because the blank has been replaced with a letter. The letter is called a **variable**.

EXAMPLE: Arithmetic $5 + \underline{\quad} = 14$
Algebra $5 + x = 14$

The goal in any algebra problem is to move all the numbers to one side of the equal sign and have the letter (called a **variable**) on the other side. In this problem, the 5 and the "x" are on the same side. The 5 is added to x. To move it, do the **opposite** of add. The **opposite** of add is **subtract**, so subtract 5 from both sides of the equation. Now the problem looks like this:

$$\begin{array}{r} 5 + x = 14 \\ -5 \quad -5 \\ \hline x = 9 \end{array}$$

To check your answer, put 9 in the place of x in the original problem. Does $5 + 9 = 14$? Yes, it does.

EXAMPLE: $y - 16 = 27$ Again, the 16 has to move. To move it to the other side of the equation, we do the **opposite** of subtract. We **add** 16 to both sides.

$$\begin{array}{r} y - 16 = 27 \\ +16 +16 \\ \hline y = 43 \end{array}$$

Check by putting 43 in place of the y in the original problem. Does $43 - 16 = 27$? Yes.

Solve the problems below.

- $n + 9 = 27$
- $12 + y = 55$
- $51 + v = 67$
- $f + 16 = 31$
- $5 + x = 23$
- $15 + x = 24$
- $w - 14 = 89$
- $t - 26 = 20$
- $m - 12 = 17$
- $c - 7 = 21$
- $k - 5 = 29$
- $a + 17 = 45$
- $d + 26 = 56$
- $15 + x = 56$
- $y + 19 = 32$
- $t - 16 = 28$
- $m + 14 = 37$
- $y - 21 = 29$
- $f + 7 = 31$
- $h - 12 = 18$
- $r - 12 = 37$
- $h - 17 = 22$
- $x - 37 = 46$
- $r - 11 = 28$
- $t - 5 = 52$

ONE-STEP ALGEBRA PROBLEMS WITH MULTIPLICATION AND DIVISION

Solving one-step algebra problems with multiplication and division is just as easy as solving addition and subtraction problems. Again, you perform the **opposite** operation. If the problem is a **multiplication** problem, you **divide** to find the answer. If it is a **division** problem, you **multiply** to find the answer. Carefully read the examples below, and you will see how easy they are.

EXAMPLE 1: $4x = 20$

($4x$ means 4 times x . 4 is the **coefficient** of x .)

The goal is to get the numbers on one side of the equal sign and the variable x on the other side. In this problem, the 4 and x are on the same side of the equal sign. The 4 has to be moved over. $4x$ means 4 times x . The opposite of **multiply** is **divide**. If we divide both sides of the equation by 4, we will find the answer.

$$4x = 20$$

We need to divide both sides by 4.

This means divide by 4. $\frac{1}{4} \times \frac{4x}{1} = \frac{5}{1} \times \frac{20}{1}$ We see that $1x = 5$ so $x = 5$

When you put 5 in place of x in the original problem, it is correct. $4 \times 5 = 20$

EXAMPLE 2: $\frac{y}{4} = 2$

This problem means y divided by 4 is equal to 2. In this case, the opposite of **divide** is **multiply**. We need to multiply both sides of the equation by 4.

$$4 \times \frac{y}{4} = 2 \times 4 \text{ so } y = 8$$

When you put 8 in place of y in the original problem, it is correct. $\frac{8}{4} = 2$

Solve the problems below.

1. $2x = 14$ 5. $5a = 60$ 9. $7r = 98$ 13. $8t = 96$ 17. $6d = 84$

2. $\frac{w}{5} = 11$ 6. $\frac{x}{3} = 9$ 10. $\frac{y}{3} = 2$ 14. $\frac{z}{2} = 15$ 18. $\frac{t}{3} = 3$

3. $3h = 45$ 7. $6d = 66$ 11. $\frac{x}{4} = 36$ 15. $\frac{n}{9} = 5$ 19. $\frac{m}{6} = 9$

4. $10y = 30$ 8. $\frac{w}{9} = 3$ 12. $\frac{r}{4} = 7$ 16. $4z = 24$ 20. $9p = 72$

Sometimes the answer to the algebra problem is a **fraction**. Read the example below, and you will see how easy it is.

EXAMPLE

$4x = 5$ Problems like this are solved just like the problems on the previous page. The only difference is that the answer is a **fraction**.

In this problem, the 4 is **multiplied** by x . To solve, we need to divide both sides of the equation by 4.

$4x = 5$ Now **divide** by 4. $\frac{4x}{4} = \frac{5}{4}$ Now cancel. $\frac{\cancel{4}x}{\cancel{4}} = \frac{5}{4}$ so $x = \frac{5}{4}$

When you put $\frac{5}{4}$ in place of x in the original problem, it is correct.

$4 \times \frac{5}{4} = 5$ Now cancel. $\longrightarrow \cancel{4} \times \frac{5}{\cancel{4}} = 5$ so $5 = 5$

*leave
answer
as a
fraction.

Solve the problems below. Some of the answers will be fractions. Some answers will be integers.

1. $2x = 3$

8. $4z = 64$

15. $3y = 8$

22. $7d = 12$

2. $4y = 5$

9. $7x = 126$

16. $2t = 10$

23. $2w = 13$

3. $5t = 2$

10. $6p = 10$

17. $3b = 2$

24. $9g = 81$

4. $12b = 144$

11. $2n = 9$

18. $5c = 14$

25. $6a = 18$

5. $9a = 72$

12. $5x = 11$

19. $4d = 3$

26. $2p = 16$

6. $8y = 16$

13. $15m = 180$

20. $5z = 75$

27. $15w = 3$

7. $7x = 21$

14. $5h = 21$

21. $9y = 4$

28. $5x = 13$

MULTIPLYING AND DIVIDING WITH NEGATIVE NUMBERS

EXAMPLE 1: $-3x = 15$

In the problem, -3 is **multiplied** by x . To find the solution, we must do the opposite. The opposite of **multiply** is **divide**. We must **divide** both sides of the equation by -3 .

$$\frac{-3x}{-3} = \frac{15}{-3}$$

Then cancel. $\frac{\cancel{-3}x}{\cancel{-3}} = \frac{15}{-3}$ $x = -5$

EXAMPLE 2: $\frac{y}{-4} = -20$

In this problem, y is **divided** by -4 . To find the answer, do the opposite. **Multiply** both sides by -4 .

$$\cancel{-4} \times \frac{y}{\cancel{-4}} = (-20) \times (-4) \quad \text{so} \quad y = 80$$

EXAMPLE 3: $-6a = 2$

The answer to an algebra problem can also be a negative fraction.

$$\frac{\cancel{-6}a}{\cancel{-6}} = \frac{2}{-6} \quad \leftarrow \text{reduce to get } a = \frac{1}{-3} \quad \text{or} \quad -\frac{1}{3}$$

Note: A negative fraction can be written several different ways.

$$\frac{1}{-3} = \frac{-1}{3} = -\frac{1}{3} = -\left(\frac{1}{3}\right)$$

All mean the same thing.

Solve the problems below. Reduce any fractions to lowest terms.

1. $2z = -6$

6. $\frac{r}{-2} = -10$

11. $\frac{x}{-4} = -9$

16. $-15w = -60$

2. $\frac{y}{-5} = 20$

7. $9x = -72$

12. $7t = -49$

17. $\frac{y}{-9} = -4$

3. $-6k = 54$

8. $\frac{x}{-6} = 3$

13. $-14x = -28$

18. $\frac{d}{8} = -7$

4. $4x = -24$

9. $\frac{w}{-11} = 5$

14. $\frac{m}{3} = -12$

19. $-12v = 36$

5. $\frac{t}{7} = -4$

10. $5y = -35$

15. $-8z = 32$

20. $\frac{c}{-6} = -6$