

Notes for 1.1 Linear Equations (pp. 86 – 90)

Name:
Date:
Instructor:

Topics: Solving all types of linear equations.

Vocabulary to Use:

Equation	Conditional	Equivalent equations
Solution Set	Identity	Lowest common denominator
Root	Contradiction	Null set

I. Terminology of Equations (p. 86)

An _____ is a statement that _____
_____. Ex. $5y - 15 = 2$; $3x^2 - 2x - 1 = 0$

To **solve** an equation means to _____.

These numbers are called _____ or _____ of the equation.

Equations with the same _____ set are called _____.

II. Solving Linear Equations (pp. 86 – 88)

Properties to use to solve equations: For all real numbers, a , b and c :

1. Addition Property of Equality: If $a = b$, then $a + c = b + c$, or you can _____ or subtract the same value to both sides of an equation _____.

2. Multiplication Property of Equality: If $c \neq 0$, then $a = b$ and $ac = bc$ are equivalent, or you can _____ or divide by the same nonzero number _____.

A **linear equation** with one variable is any equation that can be written in the form _____ where a and b are real numbers and $a \neq 0$.

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

To check the solution of the example, you _____ the value in for x into the original equation. If you get a true statement when working both sides down to a single value, then the solution is the correct one.

Ex. Solve $\frac{5}{6}x - 2x + \frac{1}{3} = \frac{2}{3}$ (Multiply the Lowest Common Denominator to clear the fractions. For this example, use _____.)

Check:

Ex. $2[x - (4 + 2x) + 3] = 2x + 2$

Check:

III. Special Types of Equations (pp. 88 – 89)

1. An **identity** is _____
2. A **conditional equation** is _____
3. A **contradiction** is _____

Ex. Decide whether these are an **identity**, a **conditional equation**, or a **contradiction**.

a. $-2(x + 4) + 3x = x - 8$

b. $3(3x - 1) = 9x + 7$

IV. Solving for a Specified Variable (pp. 89 – 90)

First factor out what you want, then move other terms to isolate the term with the h , then divide to get h alone.

Ex. Solve $S = 2lw + 2wh + 2hl$, for h

Calculator Hints:

1. To solve a linear equation, you can use a graphing feature of the calculator.
 - a. Type in the left side of the equation into Y_1 .
 - b. Type in the right side of the equation into Y_2 .
 - c. Use ZOOM 6:Standard to draw the two lines. Make adjustments to the WINDOW as needed, so that the calculator “sees” where these 2 lines intersect.
 - d. Use 2^{nd} – CALC (on top of TRACE) – 5:Intersection.
 - e. The solution to the equation is the “X=” value at the bottom of the screen. This is the x-value that works in both expressions.
2. Two ways to check a linear equation:
 - a. Method 1 when solution is an integer: Put left and right side into Y_1 and Y_2 as above. Use 2^{nd} TABLE (on top of GRAPH) to find a X value that has a common Y_1 and Y_2 value. X value does not have to be the same as the Y_1 and Y_2 .
Ex. $X=-2$ would be correct when Y_1 and Y_2 have a match of 3 in the TABLE.
 - b. Method 2 when solution is any real number: Uses the “Store As” key (beside #1).
Enter the possible answer - STO \rightarrow X, t, θ, n – Enter.
Type in the left side of the equation on the home screen, then Enter.
Type in the right side of the equation on the home screen, then Enter.
Those two entries should get the same answer if the stored value is correct.
3. If there is only one variable in the equation to be solve, use x as that variable, no matter what letter of the alphabet was in the original problem. It is much easier to work with, since it has its own button of X, t, θ, n .
4. Be careful when entering fractions into the calculator (Ex. 2, page 87). You must use parentheses around a numerator or denominator that has more than one term in it. You would enter $(2x + 4) \div 3 + (1 \div 2)x$ as Y_1 , then Enter and $(1 \div 4)x - 7 \div 3$ as Y_2 , then Enter. Use 2^{nd} – CALC - 5:Intersect, with a point of intersection at $X = -4$. This is the solution to the equation

Assignments:

Text: pp. 90 – 92 #1 – 35 odd, 39, 41, 44 – 46, 59 – 67 eoo

“A Review of Algebra”: pp. 50 – 51 # 5 – 17 odd, 21 – 29 odd, 33 - 41