1.1 Notetaking with Vocabulary

***Learning target*: Understand solving liner equations.**

Success criteria: I can describe how to solve simple equations.

Write the meaning of each vocabulary term.

conjecture – guess – unproven mathematical statement

rule
theorem } proven statement about a mathematical concept

equation – a statement that 2 expressions are equal

$x+10=5$ (expression = expression)

linear equation in one variable

an equation that can be written $ax+b=0$

$5x-2=0$

solution

– a number (s) that makes equation true

inverse operations – operations that undo each other

$\cdot/\div$ $\sqrt{x}/x^2$ $+/-$

equivalent equations – equations that have the same solutions

Core Concepts — Rules

Addition Property of Equality

Words Adding the same number to each side of an equation produces an equivalent equation.

Algebra If $a = b$, then $a + c = b + c$.

Notes: $z - 5 = 8$ → Addition Property of Equality

$+5 \quad +5$

$z = 13$

Subtraction Property of Equality

Words Subtracting the same number from each side of an equation produces an equivalent equation.

Algebra If $a = b$, then $a - c = b - c$.

Notes:

$w + 4 = 16$

$-4 \quad -4$ Sub. Prop. of =

$w = 12$

Justify

Check

$(12) + 4 \stackrel{?}{=} 16$

$16 = 16$ ✓

Multiplication Property of Equality

Words Multiplying each side of an equation by the same nonzero number produces an equivalent equation.

Algebra If $a = b$, then $a \cdot c = b \cdot c$, $c \neq 0$.

Notes:

$\frac{2}{1} \cdot \frac{n}{2} = -15 \cdot -2$

$n = 30$

Check

$\frac{30}{-2} \stackrel{?}{=} -15$

$-15 = -15$ ✓

Division Property of Equality

Words Dividing each side of an equation by the same nonzero number produces an equivalent equation.

Algebra If $a = b$, then $a \div c = b \div c$, $c \neq 0$.

Notes:

$\frac{7q}{7} = \frac{35}{7}$

$q = 5$

Check

$7(5) \stackrel{?}{=} 35$

$35 = 35$ ✓

Four Step Approach to Problem Solving

1. **Understand the Problem** What is the unknown? What information is being given? What is being asked?
2. **Make a Plan** This plan might involve one or more of the problem-solving strategies shown on the following page.
3. **Solve the Problem** Carry out your plan. Check that each step is correct.
4. **Look Back** Examine your solution. Check that your solution makes sense in the original statement of the problem.

Common Problem-Solving Strategies

Use a verbal model.	Guess, check, and revise.
Draw a diagram.	Sketch a graph or number line.
Write an equation.	Make a table.
Look for a pattern.	Make a list.
Work backward.	Break the problem into parts.

multiplication

After a party, you have $\frac{2}{5}$ of the brownies you made left over. There are 16 brownies left.

How many brownies did you make for the party?

$\frac{2}{5} \cdot$ (brownies made) = brownies left ← verbal model

$\frac{8}{2} \cdot \frac{2}{8} \cdot b = \frac{16}{1} \cdot \frac{5}{2}$ ← equation I made 40 brownies.

$b = 40$

Extra Practice: In Exercises 1–9, solve the equation. Justify each step. Check your solution for 1 and 5.

1. $x + 7 = -12$
2. $-15 + w = 6$
3. $-2 = y - 9$
4. $4b = -52$
5. $3 = \frac{q}{11}$