Foundations of Algebra
Unit 4

Name: **Answer Key**
Date:_____ Period:____

Unit 4 Review

What you need to know & be able to do	Things to remember	Examples	
1. Solving One Step Equations	• Use Inverse operations	a. Solve $5 + m = 2$ $-5 \quad -5$ $m = -3$	b. Solve $\frac{x}{7} = 3 \cdot -7$ $x = -21$
2. Solving Two Step Equations	• Use Inverse operations	a. Solve $\frac{x}{6} + 4 = 15$ $\quad -4 \quad -4$ $\frac{x}{6} = 11 \cdot 6$ $x = 66$	b. Solve $\frac{x-4}{3} = -6 \cdot 3$ $x - 4 = -18$
3. Solving Multi-Step Equations	• Use Inverse operations	a. Solve $-5(3 + x) + 25 = 15$ $\quad -25 \quad -25$ $\frac{-5(3+x)}{-5} = \frac{-10}{-5}$ $3 + x = 2$ $-3 \quad -3$ $x = -1$	b. Solve $3x - 6 = 12 - 3x$ $+3x \qquad +3x$ $6x - 6 = 12$ $\quad +6 \quad +6$ $\frac{6x}{6} = \frac{18}{6}$ $x = 3$
4. Solving Equations with Infinite or No Solution	• False Equation, variables drop out – No Solution • True Equation, variables drop out – Infinite Solutions • Variable = # - One Solution	a. Solve $4(2x + 1) = 5x + 3x + 9$ $8x + 4 = 5x + 3x + 9$ $8x + 4 = 8x + 9$ $-8x \qquad -8x$ $4 \neq 9$ **NO SOLUTION**	b. Solve $5(x + 2) - 3x = 2(x + 5)$ $5x + 10 - 3x = 2x + 10$ $2x + 10 = 2x + 10$ **INFINITE SOLUTION**
		c. Solve $-4x + 2(5x - 6) = -3x - 39$ $-4x + 10x - 12 = -3x - 39$ $6x - 12 = -3x - 39$ $+3x \qquad +3x$ $9x - 12 = -39$ $\quad +12 \quad +12$ $\frac{9x}{9} = \frac{-27}{9}$ $x = -3$ **ONE SOLUTION**	d. Solve $-10n + 3(8 + 8n) = -6(n - 4)$ $-10n + 24 + 24n = -6n + 24$ $14n + 24 = -6n + 24$ $+6n \qquad +6n$ $20n + 24 = 24$ $\quad -24 \quad -24$ $\frac{20n}{20} = \frac{0}{20}$ $n = 0$ **ONE SOLUTION**

5. Solving Equations with Fractions	• Multiply by a Reciprocal • Multiply by Common Denominator • Cross Multiply	a. $\frac{-2}{7}x = 4$ $\cdot -\frac{7}{2}$ $x = \frac{-28}{2}$ $x = -14$	b. $\frac{2\cdot}{2\cdot}\frac{y}{6} + \frac{y\cdot 3}{4\cdot 3} = 5$ FIND LCD * $\frac{2y}{12} + \frac{3y}{12} = 5$ $12\cdot\frac{5y}{12} = 5\cdot 12$ $\frac{5y}{5} = \frac{60}{5}$ $\boxed{y=12}$
		c. $\frac{1}{3} + 2m = m - \frac{3}{2}$	d. $\frac{8-x}{3} = \frac{5}{2}$
6. Solving and Graphing Linear Inequalities.	• Solve an inequality by isolating the variable. • Golden Rule: Dividing by a negative number flips the inequality.	a. Solve and graph: $9 < 3x$	b. Solve and graph: $4 > -3x + 10$
		c. Solve and graph $3(x+2) < -2$	d. Solve and name 3 solutions $7 - 2t \le 21$
7. Creating Equations and Inequalities	• Define a variable for what you are solving for • Look for key words • Consecutive Integers: x, x + 1, x + 2, ... • Consecutive Even/Odd Integers: x, x + 2, x + 4, ...	a. Alex belongs to a music club. In this club, students can buy a student discount card for $19.95. This card allows them to buy CDs for $3.95 each. After one year, Alex has spent $63.40. How many CDs did Alex buy? $19.95 + 3.95C = 63.40$ $19.95 =$ initial cost $3.95 =$ cost of a CD $C =$ ~~amount~~ # of CDs purchased $63.40 =$ total $ spent	b. Cecilia has $30 dollars to spend at a carnival. Admission costs $5 and each ride ticket costs $1.50. What is the maximum amount of tickets she can purchase? $5 + 1.50t = 30$ $5 =$ initial admission cost $1.50 =$ price per ticket $t =$ # of tickets $30 = $ to spend

NOT REQUIRED FOR THIS UNIT

		c. Three consecutive integers add up to 153. Find the three integers. $\boxed{50, 51, 52}$ $x + x+1 + x+2 = 153$ $x + x+1+x + 2 = 153$ $3x + 3 = 153$ $\quad -3 \quad -3$ $\dfrac{3x = 150}{3}$ $x = 50$	d. Three ODD integers add up to 381. Find the integers. $\boxed{125, 127, 129}$ $x + x+2 + x+4 = 381$ $x + x+2+x+4 = 381$ $3x + 6 = 381$ $\quad -6 \quad -6$ $\dfrac{3x}{3} = \dfrac{375}{3}$ $x = 125$
	✕HINT✕ 3 hours = $60 a = additional hours	e. The Beach Shack rents boats for $60 for the first three hours and $30 for each hour after that. If you spent $180, how many hours did you rent a boat? Create an equation and then solve. Equation: $60 + 30a = 180$ Starting ↑ additional pt (3 hrs) hours $60 + 30a = 180$ $-60 \qquad\qquad -60$ $\dfrac{30a}{30} = \dfrac{120}{30}$ $a = 4$ additional hours starting point $\to 3 + 4 = 7$ total hours	f. Melissa bought 3 loaves of freshly baked bread at a specialty bread shop. She paid twice as much for the Whole Grain bread as she did for the French bread. She paid $2.50 more for the Cinnamon Raisin bread as she did for the Whole Grain bread. She spent a total of $11.25 for the 3 loaves. How much did each loaf cost? Create an equation and use it to solve. French Bread: x Whole Grain: $2x$ Cinnamon Raisin: $2x + 2.50$ Equation: $x + 2x + 2x + 2.50 = 11.25$ $x + 2x + 2x + 2.50 = 11.25$ $\qquad\qquad -2.50 \quad -2.50$
8. Isolating a Variable (Literal Equations)	• Using the properties of equalities solve an equation with more than one variable for a chosen variable.	a. Solve the equation for h: $\dfrac{S}{2\pi r} = \dfrac{2\pi r h}{2\pi r}$ $\dfrac{S}{2\pi r} = h$	b. Solve for y: $8x - 4y = 16$ $-8x \qquad -8x$ $\dfrac{-4y}{-4} = \dfrac{16 - 8x}{-4}$ $y = 4 + 2x$
		c. Solve the equation for a: 10. $g = \dfrac{b + 2a}{10} \cdot 10$ $10g = b + 2a$ $-b \qquad -b$ $\dfrac{10g - b}{2} = \dfrac{2a}{2}$ $5g - \dfrac{b}{2} = a$	d. The formula $a = 46c$ gives the floor area a in square meters that can be wired using c circuits. a. Solve for c. $a = 46c$ $c = \dfrac{a}{46}$ b. If the room is 322 square meters, how many circuits are required to wire this room?

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