12-15-17

Aim: SWBAT identify and determine the solution of identities and contradictions.

HW: Packet Pages 27 & 31 - 34
Quiz Tuesday

Do Now: Check hw

7) $10(0.4x - 3.6) = 10(0.3x + 1.2)$

$4x - 36 = 3x + 12$

$-3x \quad -3x$

$x - 36 = 12$

$+36 \quad +36$

$x = 48$

* 8) $100(0.4x - 0.6) = 100(0.16x - 0.36)$

$40x - 60 = 16x - 36$

$-16x \quad -16x$

$24x - 60 = -36$

$+60 \quad +60$

$\frac{24x}{24} = \frac{24}{24}$

$x = 1$

9) $10(3.5x + 6) = 10(1.5x)$

$35x + 60 = 15x$

$-35x \quad -35x$

$\frac{60}{-20} = \frac{-20x}{-20}$

$-3 = x$

HOMEWORK - SOLVING EQUATIONS WITH SQUARE ROOTS AND "CLEARING OUT" the FRACTIONS OR DECIMALS

Evaluate.

1) $\sqrt{144}$ 12

2) $-\sqrt{81}$ -9

3) $\pm\sqrt{25}$ ± 5

4) $-\sqrt{4}$ -2

5) $\pm\sqrt{100}$ ± 10

SOLVE each equation algebraically. *REMEMBER-Square roots have TWO SOLUTIONS!*

1) $\sqrt{x^2} = \sqrt{16}$

$x = \pm 4$

2) $\sqrt{x^2} = \sqrt{196}$

$x = \pm 14$

3) $\frac{2x^2}{2} = \frac{128}{2}$

$\sqrt{x^2} = \sqrt{64}$

$x = \pm 8$

4) $x^2 - 44 = 100$

$+44 \quad +44$

$\sqrt{x^2} = \sqrt{144}$

$x = \pm 12$

5) $x^2 - 23 = 58$

$+23 \quad +23$

$\sqrt{x^2} = \sqrt{81}$

$x = \pm 9$

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6) $2x^2 + 10 = 60$

$-10 \quad -10$

$\frac{2x^2}{2} = \frac{50}{2}$

$\sqrt{x^2} = \sqrt{25}$

$x = \pm 5$

7) $3x^2 + 12 = 204$

$-12 \quad -12$

$\frac{3x^2}{3} = \frac{192}{3}$

$\sqrt{x^2} = \sqrt{64}$

$x = \pm 8$

Solve each equation by "clearing out" the fractions or decimals.
REMEMBER:

1) $10\left(-\frac{3}{5} + x = \frac{7}{10}\right)10$

$-6 + 10x = 7$

$+6 \quad +6$

$\frac{10x}{10} = \frac{13}{10}$

$x = \frac{13}{10}$

2) $4\left(\frac{3}{4}x - 7 = \frac{1}{2}x + 3\right)4$

$3x - 28 = 2x + 12$

$-2x \quad -2x$

$x - 28 = 12$

$+28 \quad +28$

$x = 40$

3) $12\left(\frac{2}{3}x + \frac{1}{4}x = 22\right)12$

$8x + 3x = 264$

$\frac{11x}{11} = \frac{264}{11}$

$x = 24$

4) $10\left(0.9x + 1.2 = 0.5x - 2\right)10$

$9x + 12 = 5x - 20$

$-5x \quad -5x$

$4x + 12 = -20$

$-12 \quad -12$

$\frac{4x}{4} = \frac{-32}{4}$

$x = -8$

5) $10\left(3.8 - 0.5x = 0.3\right)10$

$38 - 5x = 3$

$-38 \quad -38$

$\frac{-5x}{-5} = \frac{-35}{-5}$

$x = 7$

6) $100\left(0.25x + 3.4 = 1.65\right)100$

$25x + 340 = 165$

$-340 \quad -340$

$\frac{25x}{25} = \frac{-175}{25}$

$x = -7$

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AIM: SWBAT identify and determine the solution of identities and contradictions.

IDENTITIES AND CONTRADICTIONS

Do Now: Read the notes below.

When solving an equation, we are looking for the value of the variable that will make the equation a true statement.

$$2x + 4 = 10$$
$$-4 \quad -4$$
$$\frac{2x}{2} = \frac{6}{2}$$
$$x = 3$$

** There is only one solution to this equation. 3 is the only number that will make the equation true.

Sometimes, a linear equation can also have no solution, or an infinite number of solutions.

One Solution	No Solution	Infinite Number of Solutions
$2x = x + 1$ $-x \quad -x$ $x = 1$ Only one number makes the equation true.	$x + 1 = x + 2$ $-x \quad -x$ $1 \neq 2$ Since $1 \neq 2$ can NEVER be true, there are NO numbers that can make the equation true. This type of equation is called a **CONTRADICTION**.	$x + 3 = x + 3$ $-x \quad -x$ $3 = 3$ Since $3 = 3$ is ALWAYS true, you can substitute ANY number for x and the equation will be true. This type of equation is called an **IDENTITY**.

Determine if the following equations have no solution (Contradiction) or infinitely many solutions (Identity):

1) $10x - 15 = 5(2x + 4)$

$10x - 15 = 10x + 20$
$-10x \quad -10x$
$-15 \neq 20$

Contradiction; no solution

2) $3(2x + 4) = 6x + 12$

$6x + 12 = 6x + 12$
$-6x \quad -6x$
$12 = 12$

Identity; infinite solutions

Practice Problems: Determine if the following equations have no solution (Contradiction) or infinitely many solutions (Identity):

3) $3x + 7 = 3(x + 2)$

$3x+7 = 3x+6$

$-3x \quad -3x$

$7 \neq 6$

Contradiction; no solution

4) $2x + 9 = 2(x + 4) + 1$

$2x+9 = 2x+8+1$

$2x+9 = 2x+9$

$-2x \quad -2x$

$9 = 9$

Identity; infinite solutions

Determine if the following equations are an identity or a contradiction equation.

5) $c + d = d + c$ I

6) $x = y$ C

7) $a + b = b + c$ C

8) $x = x$ I

9) $6 = 9$ C

10) $0 = 0$ I

11) $0 = -5$ C

12) $4 = 3$ C

13) $a - b = b - a$ C

14) $a = a$ I

15) $a + b = a + b$ I

16) $5 = 5$ I

17) Create an equation that is a CONTRADICTION. _____

18) Create an equation that is an IDENTITY. _____

Homework – Identities and Contradictions

- An Identity – An equation that is true for ALL values of the unknown. It has an infinite number of solutions
- A Contradiction – An equation that has NO solution

Solve each equation algebraically. If you get one solution, check your answer using a 3-Step Check. If the equation is an Identity or a Contradiction you must explain what that means in terms of the solution.

1) $3(y + 4) = y + 1 + 2y$

2) $25x - 3(8x - 4) = 16x - 4$

3) $6x - 2x = 4(x + 1)$

4) $4(y - 9) = 3(y + 4)$

5) $2x - 4(x + 2) = -2x - 8$

6) $4(x + 5) - 5(2x - 1) = x - 24$