

Student: _____
Date: _____

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Course: Math1111-Summer2018

Assignment: Section 1.2 Homework

1. Find the value of the variable that satisfies the equation. Check your solution. Answers that are not integers may be left in fractional form or decimal form.

$$2x - 5 = 7 \Rightarrow 2x = 7 + 5 \Rightarrow 2x = 12 \Rightarrow x = \frac{12}{2} \Rightarrow x = 6$$

What is the solution? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { 6 }.
- B. The solution set is {x | x is a real number}.
- C. The solution set is \emptyset .

2. Solve and check the following equation.

$$8x - 5 = 6 + 7x \Rightarrow 8x - 7x = 6 + 5 \Rightarrow x = 11$$

What is the solution? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The equation has a single solution. The solution set is { 11 }.
- B. The solution set is {x | x is a real number}.
- C. The solution set is \emptyset .

3. Solve and check the linear equation.

$$3(x - 4) + 17 = 2(x + 5) \Rightarrow 3x - 12 + 17 = 2x + 10 \Rightarrow 3x - 2x = 10 + 12 - 17 \Rightarrow x = 5$$

What is the solution? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { 5 }.
- B. The solution set is {x | x is a real number}.
- C. The solution set is \emptyset .

4. Solve and check the linear equation.

$$2(x - 3) - 3(x - 2) = x + 2 - (x - 5) \Rightarrow 2x - 6 - 3x + 6 = x + 2 - x + 5 \Rightarrow -x - x = 7 \Rightarrow x = -7$$

What is the solution? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { -7 }.
- B. The solution set is {x | x is a real number}.
- C. The solution set is \emptyset .

5. Solve.

$$\frac{5x}{2} - x = \frac{x}{10} - \frac{14}{5} = \frac{5(5x)}{5(2)} - \frac{10(x)}{10(1)} = \frac{x}{10} - \frac{2(14)}{2(5)}$$

since the denominator is the same for all terms you can drop it. Retain the numerators only

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{x \mid x \text{ is a real number}\}$.
- B. The solution set is $\{-2\}$. (Type an integer or a simplified fraction.)
- C. The solution set is \emptyset .

$$5(5x) - 10(x) = x - 2(14)$$

$$\Rightarrow 25x - 10x = x - 28$$

$$15x = x - 28$$

$$15x - x = -28$$

$$14x = -28 \Rightarrow x = \frac{-28}{14} = -2$$

6. Solve and check the linear equation.

$$\frac{x+3}{16} = \frac{9}{8} + \frac{x-4}{6} \Rightarrow \frac{3(x+3)}{3(16)} = \frac{6(9)}{6(8)} + \frac{2(x-4)}{2(6)} = 3x+9 = 54 + 2x-8$$

$$3x - 2x = 54 - 32 - 9 \Rightarrow -5x = 13$$

What is the solution? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{-\frac{13}{5}\}$. (Simplify your answer. Type an integer or a fraction.)
- B. The solution set is $\{x \mid x \text{ is a real number}\}$.
- C. The solution set is \emptyset .

$$\Rightarrow x = \frac{13}{-5}$$

$$x = -\frac{13}{5}$$

7. Solve the equation.

$$\frac{x+6}{2} = 1 - \frac{x+4}{7}; \frac{7(x+6)}{7(2)} = \frac{14(1)}{14(1)} - \frac{2(x+4)}{2(7)} \Rightarrow 7(x+6) = 14 - 2(x+4)$$

$$7x+42 = 14 - 2x - 8$$

$$7x+2x = 14 - 8 - 42 \Rightarrow 9x = -36$$

What is the solution? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{-4\}$. (Type an integer or a fraction.)
- B. The solution set is $\{x \mid x \text{ is a real number}\}$.
- C. The solution set is \emptyset .

$$\Rightarrow x = -4$$

8. The following rational equation has denominators that contain variables. For this equation, a. Write the value or values of the variable that make a denominator zero. These are the restrictions on the variable. b. Keeping the restrictions in mind, solve the equation.

$$\frac{4}{x} = \frac{16}{5x} + 4; \frac{5(4)}{5(x)} = \frac{16}{5x} + \frac{5x(4)}{5x(1)} \Rightarrow 5(4) = 16 + 20x \Rightarrow 20 = 16 + 20x$$

$$\Rightarrow 20 - 16 = 20x \Rightarrow 4 = 20x$$

a. What are the value or values of the variable that makes the denominators zero?

x = 0
(Simplify your answer. Use a comma to separate answers as needed.)

$$\Rightarrow x = \frac{4}{20} = \frac{1}{5}$$

b. Solve the equation. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{\frac{1}{5}\}$. (Simplify your answer.)
- B. There is no solution.

9.

$$\frac{3}{x} + 2 = \frac{4}{3x} + \frac{19}{9}$$

$$\frac{9(3)}{9(x)} + \frac{9x(2)}{9x(1)} = \frac{3(4)}{3(3x)} + \frac{x(19)}{x(9)} \Rightarrow 9(3) + 9x(2) = 3(4) + x(19)$$

$$27 + 18x = 12 + 19x$$

$$18x - 19x = 12 - 27$$

$$-x = -15 \Rightarrow x = 15$$

- a. Write the value or values of the variable that make a denominator zero. These are the restrictions on the variable.
 b. Keeping the restrictions in mind, solve the equation.

a. The restrictions on the variable are $x \neq 0$
 (Use a comma to separate answers as needed.)

$$x = 0$$

b. Solve the equation. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{15\}$.
 (Simplify your answer. Use a comma to separate answers as needed.)
 B. There is no solution.

10.

$$\frac{1}{x-3} + 4 = \frac{21}{x-3} \Rightarrow \frac{1 + (x-3)4}{x-3} = \frac{21}{x-3} \Rightarrow 1 + (x-3)4 = 21$$

$$1 + 4x - 12 = 21$$

$$4x - 11 = 21 \Rightarrow 4x = 32$$

$$x = 8$$

- a. Write the value or values of the variable that make a denominator zero. These are the restrictions on the variable.
 b. Keeping the restrictions in mind, solve the equation.

a. The restrictions on the variable are $x \neq 3$
 (Use a comma to separate answers as needed.)

$$x - 3 = 0 \Rightarrow x = 3$$

b. Solve the equation. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{8\}$.
 (Simplify your answer. Use a comma to separate answers as needed.)
 B. There is no solution.

11. The following rational equation has denominators that contain variables. For this equation, a. Write the value or values of the variable that make a denominator zero. These are the restrictions on the variable. b. Keeping the restrictions in mind, solve the equation.

$$\frac{5}{x+2} + \frac{2}{x-5} = \frac{14}{(x+2)(x-5)} \Rightarrow \frac{(x-5)(5)}{(x-5)(x+2)} + \frac{(x+2)(2)}{(x+2)(x-5)} = \frac{14}{(x+2)(x-5)}$$

$$5x - 25 + 2x + 4 = 14$$

$$7x - 21 = 14$$

$$7x = 14 + 21$$

$$7x = 35 \Rightarrow x = 5$$

a. What are the value or values of the variable that makes the denominators zero?

$x = -2, 5$
 (Simplify your answer. Use a comma to separate answers as needed.)

$$x + 2 = 0 \Rightarrow x = -2$$

$$x - 5 = 0 \Rightarrow x = 5$$

b. Solve the equation. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }. (Simplify your answer.)
 B. There is no solution.

No solution because

$x = 5$ makes the denominator zero, therefore $x = 5$ is excluded from the solution.

12. Solve the equation. Then determine whether the equation is an identity, a conditional equation, or an inconsistent equation.

$$2x + 10 = 5(x + 2) - 3x \Rightarrow 2x + 10 = 5x + 10 - 3x \Rightarrow 2x + 10 = 2x + 10$$

What is the solution? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The equation has a single solution. The solution set is { }.
- B. The solution set is $\{x \mid x \text{ is a real number}\}$.
- C. The solution set is \emptyset .

Any real number

What type of equation is this?

- A. a conditional equation
- B. an identity
- C. an inconsistent equation

if any real number will make the equation true then the equation is an "identity".

13. Solve the equation. Then determine whether the equation is an identity, a conditional equation, or an inconsistent equation.

$$6(x + 4) = 5 + 6x \Rightarrow 6x + 24 = 5 + 6x \Rightarrow 6x - 6x = 5 - 24 \Rightarrow 0 = -19$$

What is the solution? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The equation has a single solution. The solution set is { }.
- B. The solution set is $\{x \mid x \text{ is a real number}\}$.
- C. The solution set is \emptyset .

but $0 \neq -19$
No solution

What type of equation is this?

- A. an inconsistent equation
- B. a conditional equation
- C. an identity

if there is no solution then the equation is "inconsistent".

14. Solve the equation. Then determine whether the equation is an identity, a conditional equation, or an inconsistent equation.

$$7x + 6 = 4x + 6 \Rightarrow 7x - 4x = 6 - 6 \Rightarrow 3x = 0 \Rightarrow x = \frac{0}{3} \Rightarrow x = 0$$

What is the solution? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The equation has a single solution. The solution set is { 0 }.
- B. The solution set is $\{x \mid x \text{ is a real number}\}$.
- C. The solution set is \emptyset .

What type of equation is this?

- A. an identity
- B. a conditional equation
- C. an inconsistent equation

if the equation has a single solution then the equation is a "conditional equation".

1. A. The solution set is $\{ \underline{6} \}$.

2. A. The equation has a single solution. The solution set is $\{ \underline{11} \}$.

3. A. The solution set is $\{ \underline{5} \}$.

4. A. The solution set is $\{ \underline{-7} \}$.

5. B. The solution set is $\{ \underline{-2} \}$. (Type an integer or a simplified fraction.)

6. A. The solution set is $\{ \underline{-\frac{13}{5}} \}$. (Simplify your answer. Type an integer or a fraction.)

7. A. The solution set is $\{ \underline{-4} \}$. (Type an integer or a fraction.)

8. 0

A. The solution set is $\{ \underline{\frac{1}{5}} \}$. (Simplify your answer.)

9. 0

A. The solution set is $\{ \underline{15} \}$. (Simplify your answer. Use a comma to separate answers as needed.)

10. 3

A. The solution set is $\{ \underline{8} \}$. (Simplify your answer. Use a comma to separate answers as needed.)

11. -2,5

B. There is no solution.

12. B. The solution set is $\{x \mid x \text{ is a real number}\}$.

B. an identity

13. C. The solution set is \emptyset .

A. an inconsistent equation

14. A. The equation has a single solution. The solution set is $\{ \underline{0} \}$.

B. a conditional equation
