

keep scrolling to get
a sneak peek!

Help your Algebra 2 students
practice **rational equations**.
Students will be eager to get
the self-checking benefits from
this circuit activity!

SOLVING RATIONAL EQUATIONS

Differentiated Circuit Worksheet

oy

Date: _____

SOLVING RATIONAL EQUATIONS CIRCUIT

A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

7 → 8 → 4 → 5 → 10 → 9 → 3 → 2 → 1

$x = 3$	# 2	Previous Answer: $x = 8$
$\frac{1(x+4) - 12}{x-2} = \frac{-12}{x^2 + 2x - 8}$ $x - 4 = -12$ $-12 = -12$ $+12 \quad +12$ $3x = 0$ $\frac{3}{3}$ $x = 0$	2. Solve.	$\frac{(x+3)x}{x-3} - \frac{x(x-3)}{x+3} = \frac{x^2+9}{x^2-9}$ $x^2+3x - x^2+3x = x^2 - 9$ $6x = x^2 + 9$ $-6x \quad -6x$ $0 = x^2 - 6x + 9$ $0 = (x-3)^2$ $x = 3$
er: x	# 9	Previous Answer: $x = 3/2$
	4. Solve.	$\frac{4}{(x+1)} = \frac{2(x-3)}{x+1} + \sqrt{2}$

SOLVING RATIONAL EQUATIONS

Directions: A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → _____ → _____ → _____ → _____ → _____ → _____ → _____ → _____ → _____

Previous Answer: $x = 1/3$	# _____	Previous Answer: $x = 8$	
1. Solve.	$\frac{x}{x+5} = \frac{1}{2}$	2. Solve.	$\frac{x+7}{4} + \frac{4x}{2}$
Previous Answer: $x = -9$	# _____	Previous Answer: $x = 1/2$	
3. Solve.	$\frac{1}{3x} + \frac{1}{8} = \frac{4}{3x}$	4. Solve.	



2 versions + answer key included

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Why do you need this?



It's self-checking! Your students will know if they are correct or not.



2 differentiated versions for all students practice this essential math skill.

Solving Rational Equations Circuit

Name: _____ Date: _____

SOLVING RATIONAL EQUATIONS CIRCUIT

Directions: A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → _____ → _____ → _____ → _____ → _____

Previous Answer: $x = -3$	# _____	Previous
1. Solve. $\frac{4}{x+4} - \frac{1}{x-2} = \frac{-12}{x^2+2x-8}$		2. Solve
Previous Answer: $x = -5/2$	# _____	Previous
3. Solve. $\frac{3}{2x} - 1 = \frac{-7}{2x} - \frac{3}{8}$		4. Solve
Previous Answer: $x = 3$	# _____	Previous
5. Solve. $\frac{x}{x-1} = \frac{2x+10}{x+11}$		6. Solve
Previous Answer: $x = -10$	# _____	Previous
7. Solve. $\frac{1}{x} = \frac{x}{12} + \frac{x+3}{3x}$		8. Solve.
Previous Answer: $x = -4$	# _____	Previous
9. Solve. $\frac{2}{x+1} + \frac{20}{x^2-1} = 0$		10. Solve.
Previous Answer: $x = -9, 3$	# _____	Previous
10. Solve. $\frac{x^2}{x+3} + \frac{9(x-2)}{x+3} = 3$		

Helpful Hints: Use these hints to help you solve the problems.

- If each term of the equation has a common denominator, eliminate the denominators and solve the numerators as if it were a linear equation.
- If the denominators are different, find the LCD (least common denominator).

Solving Rational Equations Circuit *includes:*

Challenge: Solve. Show all steps.

$$\frac{1}{\frac{1}{z} + \frac{x}{x-1}} = \frac{1}{6}$$

How are you feeling about this topic? Circle one: 😊 😐 😱 😞

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- If each term of the equation has a common denominator, eliminate denominators and solve the numerators as if it were a linear equation.

$$\frac{x}{a} + \frac{y}{a} = \frac{z}{a} \gg x + y = z$$

- If the denominators are different, find the LCD (least common denominator) to eliminate the denominators.

- Always check for extraneous solutions!

How are you feeling about this topic? Circle one: 😊 😐 😱 😞

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- ✓ 10 self-checking problems
- ✓ a detailed answer key
- ✓ a standard version with an extension question
- ✓ a basic version with helpful hints section
- ✓ student self assessment

Solving Rational Equations Circuit

standards covered:

CCSS: HSA-REI.A.2

TEKs: A2.6.I, A2.6.J

VA SOLs: EI.All.3.c

SOLVING RATIONAL EQUATIONS CIRCUIT

Previous Answer: $x = -10$ # **6**

7. Solve.

$$\frac{1}{x} = \frac{x(x)}{12} + \frac{x+3}{3x} \quad (4)$$
$$12 = x^2 + 4x + 12$$
$$0 = x(x+4)$$
$$x = 0 \quad \boxed{x = -4}$$

↳ extraneous

Previous Answer: $x = -4$ # **7**

8. Solve.

$$\frac{4}{3x} - \frac{2x+1}{6x} = 2 \quad (6x)$$
$$8 - 2x - 1 = 12x$$
$$7 = 14x$$
$$\boxed{x = \frac{1}{2}}$$

Previous Answer: $x = -9, 3$ # **10**

9. Solve.

$$\frac{2(x-1)}{x+1} + \frac{20}{x^2-1} = 0$$
$$2x-2+20=0$$
$$2x+18=0$$
$$2x=-18$$
$$\boxed{x = -9}$$

Previous Answer: $x = 20$ # **5**

10. Solve.

$$\frac{x^2}{x+3} + \frac{9(x-2)}{x+3} = \frac{3x+9}{x+3}$$
$$x^2+9x-18 = 3x+9$$
$$x^2+6x-27=0$$
$$(x+9)(x-3)=0$$
$$\boxed{x = -9, 3}$$

Helpful Hints: Use these hints to help you solve the problems.

- If each term of the equation has a common denominator, eliminate the denominators and solve the numerators as if it were a linear equation.

how this circuit resource works

Then search for their answer on the worksheet. Once the answer is found, students complete the problem below it.

Students can track their path at the top.

Name: _____ Date: _____

SOLVING RATIONAL EQUATIONS CIRCUIT

Directions: A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → _____ → _____ → _____ → _____ → _____ → _____ → _____ → _____ → _____ → 1

Previous Answer: $x = 1/3$ # _____	Previous Answer: $x = 8$ # _____
1. Solve. $\frac{x}{x+5} = \frac{1}{2}$	2. Solve. $\frac{x+7}{4} + \frac{4x-5}{2} = 0$
Previous Answer: $x = -9$ # _____	Previous Answer: $x = 1/2$ # _____
3. Solve. $\frac{1}{3x} + \frac{1}{8} = \frac{4}{3x}$	4. Solve. $\frac{2}{x+2} + \frac{5}{x-2} = \frac{6}{x^2-4}$

Students start with the first question.

The last question they answer should lead back to problem #1 to "close" the circuit.

how to use this resource

This is a great activity to use when reviewing how to solve rational equations by finding the LCM.

It can be used right after teaching the concept or as homework.

This is also a **substitute-friendly** assignment!

Name: **Answer Key** Date: _____

SOLVING RATIONAL EQUATIONS CIRCUIT

Directions: A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → **6** → **7** → **8** → **4** → **5** → **10** → **9** → **3** → **2** → 1

Previous Answer: $x = 1/3$ # 2	Previous Answer: $x = 8$ # 3
1. Solve. $\frac{x}{x+5} = \frac{1}{2}$ $2x = x+5$ $-x -x$ $x = 5$	2. Solve. $\frac{x}{x+5} = \frac{1}{2}$ $2x = x+5$ $-x -x$ $x = 5$
Previous Answer: $x = -9$	Previous Answer: $x = -8, -4$ # 7
3. Solve. $\frac{1}{3x} + \frac{1}{8} = \frac{4}{3x}$ $8 + 3x = 5$ $-8 -8$ $3x = 24$ 3 $x = 8$	8. Solve. $\frac{(x-1)x+3}{x} - 1 = \frac{1}{x-1}$ $x^2+2x-3 - x^2+x = x$ $3x-3 = x$ $-x -x$ $2x-3 = 0$ $+3 +3$ $\frac{2x = 3}{2}$ $x = 3/2$
Previous Answer: $x = 0$	Previous Answer: $x = -2, 5$ # 5
5. Solve. $\frac{2}{x} = \frac{3}{2x-10}$ $2(2x-10) = 3x$ $4x - 20 = 3x$ $-3x -3x$ $x - 20 = 0$	10. Solve. $\frac{(2x)}{x+1} = 2 - \frac{5}{2x}$ $4x^2 = 4x^2 + 4x - 5x - 5$ $-4x^2 - 4x^2$ $0 = -x - 5$ $+x +x$ $x = -5$
7. Solve. $\frac{2}{3x+6} = \frac{x+2}{x^2-10}$ $2(x^2-10) = (x+2)(3x+6)$ $2x^2-20 = 3x^2+12x+12$ $-2x^2+20 -2x^2 +20$ $0 = x^2+12x+32$ $0 = (x+8)(x+4)$ $x = -8, -4$	9. Solve. $\frac{(x+4)}{x+3} = \frac{x+2}{(x+1)}$ $\frac{x^2-3x-4}{(x-4)(x+1)} = \frac{x^2-16}{(x-4)(x+4)}$ $x^2+7x+12 = x^2+3x+2$ $-x^2 -x^2$ $7x+12 = 3x+2$ $-3x -3x$ $4x+12 = 2$ $-12 -12$ $4x = -10$ $\frac{4x = -10}{4} \rightarrow x = -\frac{5}{2}$



hey there!

My name is Malia and I'm passionate about making learning and practicing math fun. I love creating engaging math resources for my students and I hope your students enjoy this activity too!

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