LESSON MAKER PRO

Rational Equation Reality

Solve, check restrictions, and judge context.

HIGH SCHOOL · MA.912.AR.8.1

MA.912.AR.8.1 "Write and solve one-variable rational equations. Interpret solutions as viable in terms of the context and identify any extraneous solutions."

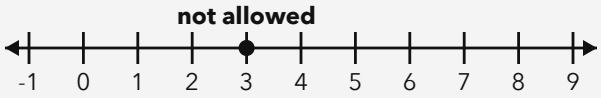
NAME _____ DATE _____

CLEAR DENOMINATORS CAREFULLY

First list values that make any denominator zero. Multiply both sides by the least common denominator, solve, then check each result in the original equation and the context.

WORKED EXAMPLE

The marked value is not allowed. Solve $(x + 1)/(x - 3) = 2$.



1. Restriction: $x \neq 3$.
2. Multiply by $x - 3$: $x + 1 = 2(x - 3)$.
3. Solve: $x + 1 = 2x - 6$, so $x = 7$.
4. Check: 7 is allowed.

Answer: x = 7

PRACTICE 4 problems

1 Solve $(x + 4)/(x - 5) = 4$.

ANSWER _____

2 Solve $(x - 8)/(x + 9) = 5$.

ANSWER _____

3 Solve $12/(x - 10) = 4/5$.

ANSWER _____

4 Solve $(x + 4)/(x + 8) = 9/10$.

ANSWER _____

APPLY IT Show your work

1 Use the table. The upgrade reduces the time needed to download the 126 MB video by 5 seconds. Write and solve an equation for x, the current speed. Which download speed is viable?

VIDEO DOWNLOAD

Plan	Speed	Time for 126 MB
Current	x MB/s	126/x s
Upgrade	x + 5 MB/s	126/(x + 5) s

ANSWER _____

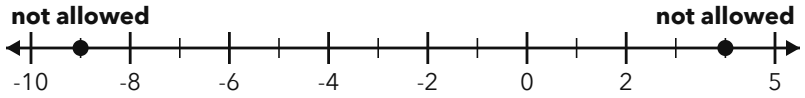
2 A robotics team splits a $120 fee equally. If 5 more students join, each student pays $4 less. Write and solve an equation for x, the original number of students.

WORK SPACE

ANSWER _____

CHALLENGE One step up

The number line marks values that make a denominator zero. Solve 8/(x + 9) + 12/(x - 4) = 4. Explain whether either solution is excluded.



WORK SPACE AND ANSWER

ANSWER KEY

Rational Equation Reality

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve (x + 4)/(x - 5) = 4.	**x = 8**
2	Solve (x - 8)/(x + 9) = 5.	**x = -53/4**
3	Solve 12/(x - 10) = 4/5.	**x = 25**
4	Solve (x + 4)/(x + 8) = 9/10.	**x = 32**

PART 2 · APPLY IT

1. **x = 9 MB/s is viable. x = -14 MB/s is nonviable.** Use 126/x - 126/(x + 5) = 5. The solutions are 9 and -14, but speed cannot be negative.
2. **x = 10 students is viable. x = -15 is nonviable.** Use 120/x - 120/(x + 5) = 4. The solutions are 10 and -15, and only a positive student count works.

CHALLENGE

x = √55 or x = -√55. Neither solution is excluded because neither equals -9 or 4.

Accept equivalent algebraic work and exact radical forms. Reject any value that makes a denominator zero, and require students to reject negative rates or student counts in context.