

Unit 2 Lesson 21: Rational Equations (Part 2)

1 Math Talk: Adding Rationals (Warm up)

Student Task Statement

Solve each equation mentally:

$$\frac{x}{2} = \frac{3}{4}$$

$$\frac{3}{x} = \frac{1}{6}$$

$$\frac{1}{4} = \frac{1}{x^2}$$

$$\frac{2}{x} = \frac{x}{8}$$

2 A Rational River

Student Task Statement

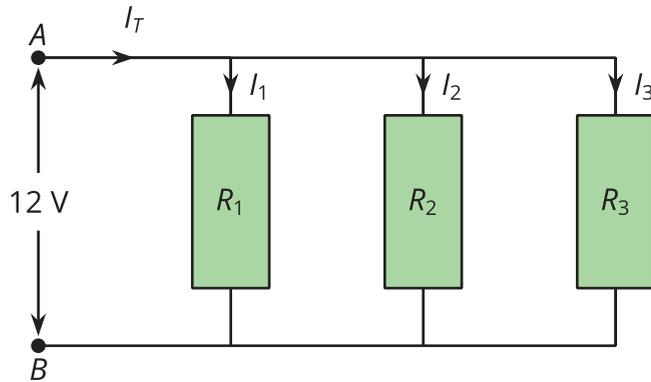
Noah likes to go for boat rides along a river with his family. In still water, the boat travels about 8 kilometers per hour. In the river, it takes them the same amount of time t to go upstream 5 kilometers as it does to travel downstream 10 kilometers.



1. If the speed of the river is r , write an expression for the time it takes to travel 5 kilometers upstream and an expression for the time it takes to travel 10 kilometers downstream.
2. Use your expressions to calculate the speed of the river. Explain or show your reasoning.

3 Rational Resistance

Images for Launch



Student Task Statement

Circuits in parallel follow this law: The inverse of the total resistance is the sum of the inverses of each individual resistance. We can write this as: $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \dots + \frac{1}{R_n}$ where there are n parallel circuits and R_T is the total resistance. Resistance is measured in ohms.

1. Two circuits are placed in parallel. The first circuit has a resistance of 40 ohms and the second circuit has a resistance of 60 ohms. What is the total resistance of the two circuits?
2. Two circuits are placed in parallel. The second circuit has a resistance of 150 ohms more than the first. Write an equation for this situation showing the relationships between R_T and the resistance R of the first circuit.
3. For this circuit, Clare wants to use graphs to estimate the resistance of the first circuit R if R_T is 85 ohms. Describe how she could use a graph to determine the value of R and then follow your instructions to find R .