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

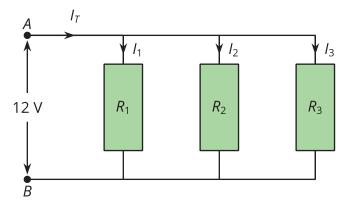
Noah likes to go for boat rides along a river with his family. In still water, the boat travels about 8 kilometers per hour. In the river, it takes them the same amount of time t to go upstream 5 kilometers as it does to travel downstream 10 kilometers.



- 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: $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots + \frac{1}{R_n}$ 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.