

Solving Equations and Word Problems Containing Rational Expressions Video Lecture

Sections 7.5 and 7.6

Course Learning Objective:

- 1) Solve certain types of rational equations.**
- 2) Model applications based on these types of equations.**

Weekly Learning Objectives:

- 1) Solve equations containing rational expressions.**
- 2) Solve equations containing rational expressions for a specified variable.**
- 3) Solve equations with negative exponents.**
- 4) Solve problems about work.**
- 5) Solve problems about distance.**

Solving Equations and Word Problems with Rational Expressions

How to solve equations containing rational expressions:

- 1) Find the LCD of all fractions in the equation
- 2) Multiply both sides of the equation (EACH TERM) by the LCD
- 3) Simplify and the equation should no longer contain fractions
- 4) Classify resulting equation and solve accordingly
- 5) Spot check for solutions

Solve:

$$\frac{2}{3x+1} = \frac{1}{x} - \frac{6x}{3x+1}$$

$$\frac{5}{x^2-7x+12} = \frac{2}{x-3} + \frac{5}{x-4}$$

$$\frac{3}{k+2} + \frac{1}{2-k} = \frac{2}{k^2-4}$$

$$\frac{5x+14}{x^2-9} = \frac{-2x^2-5x+2}{x^2-9} + \frac{2x+4}{x-3}$$

$$p^{-2} + 4p^{-1} - 5 = 0$$

Solve for x : $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$

Word Problems:

Jim's boat goes 12 miles per hour. Find the speed of the current of the river if he can go 6 miles upstream in the same amount of time he can go 10 miles downstream.

An F-100 plane and a Toyota Truck leave the same town at sunrise and head for a town 450 miles away. The speed of the plane is three times the speed of the truck, and the plane arrives 6 hours ahead of the truck. Find the speed of the truck.

An experienced bricklayer constructs a small wall in 3 hours. An apprentice completes the job in 6 hours. Find how long it takes if they work together.

Mike can paint a room in 6 hours working alone. If Joan helps him, the job takes 4 hours. How long would it take Joan to do the job if she worked alone?