

MTH 28.5 LECTURE NOTES (Ojakian)

Topic 26: Solving Rational Equations

OUTLINE

References: 7.4

1. Doing the same thing to both sides of an equation?
 2. Rational equations
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1. Rational Equations Strategy

- (a) Find numbers where original equation UNDEFINED.
- (b) Clear the fractions to convert it into a polynomial equation
- (c) Solve
- (d) Throw out any UNDEFINED numbers (these are “extraneous solutions”)

2. Examples

PROBLEM 1. Solve the following equations.

(a) $\frac{4}{x} = x$

(b) $\frac{x}{2} + 5 = \frac{7}{4} - \frac{3}{2}$

(c) $\frac{x}{x-2} - 7 = \frac{2}{x-2}$

(d) $\frac{2}{x^2 - 4x + 3} - \frac{3}{x^2 - 9} = \frac{2}{x^2 + 2x - 3}$

3. Doing the same thing to both sides of an equation

We typically solve equations by “**doing the same thing to both sides of the equation**”, i.e. applying the same function to both sides of an equation. For example: Adding 5 to both sides of an equation.

Does it always work? (consider the example of squaring).

NOT multiplying both sides by “ZERO” or dividing both sides by “ZERO” but otherwise the 4 arithmetic operations are fine!