MTH 28 LECTURE NOTES (Ojakian)

Topic 13: 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) $\dfrac{4}{x} = x$

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

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

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

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!