March 25 - Intermediate

*Test in 5 days!!!*

6.5 Solving Equations Containing Rational Expressions

Solving Quadratic Equations by Factoring

\[ a x^2 + b x + c = 0 \]

Factor, use zero product properly, solve

6.5 (1) Solve for \( k \)

\[ 14k^2 - 5 = -33k \]
\[ 14k^2 - 5 + 33k = -33k + 33k \]
\[ 14k^2 + 33k - 5 = 0 \]
\[ (2k - 5)(7k + 1) = 0 \]

Check: \( 14k^2 - 2k + 55k - 5 \)

\[ 2k + 5 = 0 \]
\[ 2k = -5 \]
\[ k = -\frac{5}{2} \]

\[ 7k - 1 = 0 \]
\[ 7k = 1 \]
\[ k = \frac{1}{7} \]

Solve equations containing rational expressions

Steps

ON NEXT PG
March 25 - Intermediate

* Test in 5 days!!! *

6.5 Solving Equations Containing Rational Expressions

Solving Quadratic Equations by Factoring

\[ ax^2 + bx + c = 0 \]

Factor, use zero product property, solve.

6.5.1) Solve for \( k \)

\[ 14k^2 - 5 = -33k \]

\[ 14k^2 - 5 + 33k = -33k + 33k \]

\[ 14k^2 + 33k - 5 = 0 \]

\( (2k + 5)(7k - 1) = 0 \)

Check: \( 14k^2 - 2k + 35k - 5 \)

\[ 2k + 5 = 0 \]

\[ 7k - 1 = 0 \]

\[ \frac{-5}{2} \]

\[ \frac{1}{7} \]

Solve equations containing rational expressions

Steps

1.

ON NEXT PG
Steps
1. Find values that make denominators 0; these are not solutions
2. Multiply both sides by the LCD of all rational expressions
3. Simplify both sides
4. Determine if linear, quadratic, etc. and solve accordingly
5. Check the solution in original equation

1. Solve
\[ \frac{3}{x-12} - \frac{5x}{x^2-144} = \frac{x}{x+12} \]
\[ \text{Set denom to 0} \]
\[ x-12 = 0 \quad x^2-144 = 0 \quad x+12 = 0 \]
\[ x = 12 \quad (x-12)(x+12) = 0 \]
\[ x = -12 \]
\[ x = 12 \]

These are bad numbers, cannot solve equation.

2. \[ \frac{3}{x-12} - \frac{5x}{x^2-144} = \frac{2}{x+12} \]
\[ \frac{3}{x-12} - \frac{5x}{(x-12)(x+12)} = \frac{2}{x+12} \]
\[ \text{LCD: } (x+12)(x-12) \]
\[ \frac{3(x+12)}{(x-12)(x+12)} - \frac{5x}{(x-12)(x+12)} = \frac{2}{(x+12)(x+12)} \]
\[ (x+12)(x-12) \]

3. (x+12) - 5x = 2 (x-12)
3x + 36 - 5x = 2x - 24
-2x + 36 = 2x - 24
+24
-2x + 60 = 2x
+2x
60 = 4x
\[ x = 15 \]

Check
\[ \frac{3}{15-12} - \frac{5(15)}{15^2-144} = \frac{2}{15+12} \]
\[ \frac{2}{3} = \frac{2}{3} \]
\[ V \]
29. Solve the equation for y.

\[ \frac{-4}{3y+1} + 2 = y \]

1. Denom = 0
   
   \[ 3y+1 = 0 \]

2. LCD = 3y + 1

3. \( \left( \frac{-4}{3y+1} + 2 \right) = y(3y+1) \)

4. \( \frac{(3y+1)(-4)}{3y+1} + 2(3y+1) = y(3y+1) \)

5. \(-4 + 6y + 2 = 3y^2 + y\) quadric! set to 0

6. \(-6y + 2 = 3y^2 + y\)

7. \(-6y + 2 = -6y + 2\)

Check:

\[ \frac{-y}{3y+1} + 2 = \frac{2}{3} \]

- \( \frac{-y}{3y+1} + 2 = \frac{2}{3} \)
- \( \frac{-y}{3y+1} + 2 = \frac{2}{3} \)
- \( \frac{-y}{3} + \frac{2}{3} = \frac{2}{3} \)
- \( y = \frac{2}{3} \)

\[ y = \frac{2}{3} \]

\[ y = \frac{2}{3} \]

\[ y = \frac{2}{3} \]
26. Solve the equation
\[
\frac{x+3}{x-4} = \frac{7}{x-4}
\]

1. \(x - 4 = 0\)
   \(x = 4\) is a bad number

2. \(\text{LCD} = x - 4\)

3. \(\left(\frac{x+3}{x-4}\right)(x+3) = \left(\frac{7}{x-4}\right)(x-4)\)

   \[
   \begin{align*}
   x + 3 &= 7 \\
   -3 -3
   \end{align*}
   \]

   \(x = 4\) → No solution