SOLVING RATIONAL EQUATIONS

RATIONAL EQUATION: any equation that contains one or more rational expressions.

Rational equations are easier to solve if the fractions are eliminated.

Remember: $\frac{1}{2}x + 6 = 8$

$(2)\ \frac{1}{2}x = 2\,(2)$

$x = 4$

The same thing method works with rational expressions:

1) Find the LCM and multiply it to all terms
2) Solve as a regular equation

Find LCM: 10(x+3)

$$\frac{2}{x+3}+\frac{3}{2}=\frac{19}{10}$$

$10(x+3)$ $10(x+3)$ $10(x+3)$

multiply all terms by LCM

$$\frac{2}{x+3}+\frac{3}{2}=\frac{19}{10}$$

$10(x+3)$ $5\ 10(x+3)$ $10(x+3)$

Cancel denominators

$$20 + 15(x+3) = 19(x+3)$$ Solve for x

Solve: $\frac{5}{24}+\frac{2}{3-x}=\frac{1}{4}$ LCM: 24(3-x)

Remember to Check ALL Solutions

Rational Inequalities: Inequalities with one or more rational expressions

1) State the excluded values
2) Solve the related equation
3) Use the values from #1 and #2 on a test region

$$\frac{1}{3x}+\frac{2}{9x}<\frac{2}{3}$$

1) excluded values

$3x=0$ $9x=0$

$x \neq 0$ $x \neq 0$

2) Solve the related equation using LCD

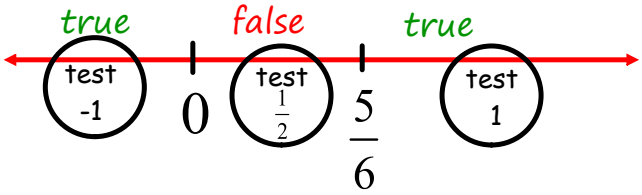
LCD: $9x$

$$\frac{1}{3x}+\frac{2}{9x}<\frac{2}{3}$$

$$3+2 = 6x$$
$$5 = 6x$$
$$\frac{5}{6} = x$$

excluded value: 0 solution: 5/6

test between 0 and 5/6



solution: $x < 0$ OR $x > \frac{5}{6}$