(MCC9-12.A.REI.2)

Solving Rational Equations

Method 1

Cross-Multiply

When would I use this method?

Each side has a single rational expression.

Example 1

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

6(x) = 2(x+2)
6x = 2x + 4
-2x -2x
4x = 4
4 4
x = 1

Example 2

$$\frac{3}{5} = \frac{m+1}{2m}$$

2m(3)=5(m+1)
6m = 5m + 5
-5m -5m
m = 5

Example 3

$$\frac{y}{5} = \frac{6}{y+7}$$

y(y + 7) = 6(5)
$y^2 + 7y = 30$
$y^2 + 7y - 30 = 0$
(y+10)(y-3) = 0
y = -10 y = 3

Method 2

Multiply by LCD

When would I use this method?

works for any rational equation involving addition or subtraction

Example 4

$$\frac{3}{x} + \frac{1}{4} = \frac{4}{x}$$

3(4)+1(x) = 4(4)
12 + x = 16
-12 -12
x = 4

Example 5

$$\frac{1}{n+1} + \frac{1}{n} = \frac{11}{n^2+n}$$

1(n)+1(n+1) = 11
n + n + 1 = 11
2n + 1 = 11
-1 -1
2n = 10
2 2
n = 5

Example 6

$$\frac{4}{x-3} + \frac{x}{x+3} = 1$$

4(x+3)+x(x-3)=1(x-3)(x+3)
$4x+12+x^2-3x=x^2-9$
$x^2+x+12=x^2-9$
x + 12 = -9
-12 -12
x = -21