The method: Solving rational equations

Multiply every term by the LCD and solve. Check each answer: one that makes a denominator 0 is not a solution.

$\frac{x^2}{x-7} = \frac{4x+21}{x-7}$ $x = -3$

$x^2 = 4x + 21$ multiply both sides by $(x - 7)$

$x^2 - 4x - 21 = 0$ move every term to one side

$(x - 7)(x + 3) = 0$ factor

$x = 7$ or $x = -3$ set each factor equal to 0

$x = 7$ makes the denominator 0, so it is not a solution. check each answer

$x = -3$

$\frac{2}{x-2} + \frac{5}{x+4} = 1$ $x = -1$ or $x = 6$

$2(x + 4) + 5(x - 2) = (x - 2)(x + 4)$ multiply every term by the LCD, $(x - 2)(x + 4)$

$7x - 2 = x^2 + 2x - 8$ distribute

$x^2 - 5x - 6 = 0$ move every term to one side

$(x + 1)(x - 6) = 0$ factor

Neither -1 nor 6 makes a denominator 0. check each answer

$x = -1$ or $x = 6$

$\frac{5}{x} - \frac{1}{5x} = -\frac{8}{5}$ $x = -3$

$25 - 1 = -8x$ multiply every term by the LCD, $5x$

$24 = -8x$

$x = -3$ divide by -8

Answer key

Problems 1 and 2 worked out · Version 0A

$\frac{x^2}{x-4} = \frac{10x-24}{x-4}$ $x = 6$

$x^2 = 10x - 24$ multiply both sides by $(x - 4)$

$x^2 - 10x + 24 = 0$ move every term to one side

$(x - 4)(x - 6) = 0$ factor

$x = 4$ or $x = 6$ set each factor equal to 0

$x = 4$ makes the denominator 0, so it is not a solution. check each answer

$x = 6$

$\frac{2}{x} + \frac{5}{2x} = \frac{3}{4}$ $x = 6$

$8 + 10 = 3x$ multiply every term by the LCD, 4x

$18 = 3x$

$x = 6$ divide by 3

Solving rational equations · Version 0A

1) $x = 6$ 2) $x = 6$ 3) $x = 8$ 4) $x = -8$
5) $x = 0$ or $x = 10$ 6) $x = -6$ 7) $x = -6$