

Math in Living C O L O R !!

1.08 Fractional Equations

College Algebra: One Step at a Time. Page 130 -133: #5

Dr. Robert J. Rapalje, Retired
Central Florida, USA

See Section 1.08, with explanations, examples, and exercises, coming soon!

For additional Fractional Equations solved in Living C O L O R, coming soon!

P. 132. # 5.
$$\frac{5}{x-2} - \frac{5}{x+2} = 4$$

Solution: That this is a fractional equation. The first step is to find the LCD, which is $(x-2)(x+2)$, and multiply both sides of the equation by the LCD, being careful NOT to allow any of the denominators to be zero. In other words, in this problem, you must be careful that $x \neq 2$ and $x \neq -2$.

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

$$(x-2)(x+2) \cdot \frac{5}{x-2} - (x-2)(x+2) \cdot \frac{5}{x+2} = 4 \cdot (x-2)(x+2)$$

This looks pretty ugly, but when you reduce all the fractions, it really is not bad. In fact, **ALL THE DENOMINATORS DIVIDE OUT!!** When you reduce all the fractions, this is what is left—**NO FRACTIONS!!**

$$5(x+2) - 5(x-2) = 4(x-2)(x+2)$$

$$5x + 10 - 5x + 10 = 4(x^2 - 4)$$

$$20 = 4x^2 - 16$$

P. 132. # 5 continued.

There are at least two ways to solve this. Probably the easiest is to add **+16** to each side:

$$20 + 16 = 4x^2 - 16 + 16$$

$$36 = 4x^2$$

$$4x^2 = 36$$

Divide both sides by 4: $x^2 = 9$

Therefore, $x = 3$ or $x = -3$

Both answers are valid, since neither value of x makes the denominator zero.

For additional Fractional Equations solved in Living C O L O R, coming soon!