

6.4 Rational Equations

Solve the equation $\frac{9}{y-3} - \frac{8}{2y-12} = \frac{18}{y^2-9y+18}$

Eliminate denominators immediately.

$$\frac{9 \cancel{(y-3)} \cancel{(y-6)}}{\cancel{y-3}} - \frac{8 \cancel{(y-3)} \cancel{(y-6)}}{2 \cancel{(y-6)}} = \frac{18 \cancel{(y-3)} \cancel{(y-6)}}{\cancel{(y-6)} \cancel{(y-3)}}$$

$$9(y-6) - 4(y-3) = 18$$

$$9y - 54 - 4y + 12 = 18$$

$$5y = 60$$

$$y = 12$$

1. Verify $\frac{1}{3} = \frac{1}{3}$

2. NPV'S

$$y \neq 3, 6$$

ex) Solve $\frac{x \cancel{(4)}(x)}{4} - \frac{7 \cancel{(4)}(x)}{x} = 3 \cancel{(4)}(x)$

$$x^2 - 28 = 12x$$

$$x^2 - 12x - 28 = 0$$

$$(x - 14)(x + 2) = 0$$

$$x = 14, -2$$

$$x \neq 0$$

ex) Solve $\frac{3x}{x+2} - \frac{5}{x-3} = \frac{-25}{x^2-x-6}$ $x \neq 3, -2$

$$\frac{3x \cancel{(x+2)(x-3)}}{\cancel{x+2}} - \frac{5 \cancel{(x+2)(x-3)}}{\cancel{x-3}} = \frac{-25 \cancel{(x+2)(x-3)}}{\cancel{(x-3)(x+2)}}$$

$$3x(x-3) - 5(x+2) = -25$$

$$3x^2 - 9x - 5x - 10 = -25$$

$$3x^2 - 14x + 15 = 0$$

$$(3x-5)(x-3) = 0$$

$$x = \frac{5}{3}, \cancel{3}$$

← extraneous root

pg. 348-350
#1-6, 21