4.6: More solving Rational Equations

• Ex 1) Solve: $\frac{4}{m-2} - \frac{3}{m-4} = 0$

$+\frac{3}{m-4}$

$\frac{4}{m-2} \neq \frac{3}{m-4}$

$m \neq 2, 4$

$4(m-4) = 3(m-2)$

$4m - 16 = 3m - 6$

$-3m \quad +16 \quad -3m \quad +16$

$m = 10$

Ex 2) Solve: $\frac{x}{x+6} - \frac{1}{7} = \frac{-6}{x+6}$

LCD: $7(x+6)$

$x \neq -6$

$\frac{x}{x+6} \cdot 7(x+6) - \frac{1}{7} \cdot 7(x+6) = \frac{-6}{x+6} \cdot 7(x+6)$

$7x - (x+6) = -6 \cdot 7$

$7x - x - 6 = -42$

$+6 \quad +6$

$\frac{6x}{6} = \frac{-36}{6}$

$x = -6$

no solution

Ex 3) Solve: $x+1=\frac{46}{x}$

LCD: x $\quad x\neq 0$

$x\cdot x+1\cdot x=\frac{46}{x}\cdot x$

$x^2+x=46$

$-46 \quad -46$

$x^2+x-46=0$

Quadratic formula: $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$x=\frac{-1\pm\sqrt{1^2-4(1)(-46)}}{2(1)}$

$\boxed{x=\frac{-1\pm\sqrt{185}}{2}}$

185

5 · 37

$\sqrt{5\cdot 37}$

you try: $\frac{10}{2y+8}-\frac{7(y+8)}{y^2-16}=\frac{-8}{2y-8}$

$2(y+4)$ $\quad (y+4)(y-4)$ $\quad 2(y-4)$

LCD: $2(y+4)(y-4)$ $\quad y\neq\pm 4$

$\frac{10}{2(y+4)}\cdot 2(y+4)(y-4)-\frac{7(y+8)}{(y+4)(y-4)}\cdot 2(y+4)(y-4)=\frac{-8}{2(y-4)}\cdot 2(y+4)$

$10y-40-14y-112=-8y-32$

$-4y-152=-8y-32$

$+8y \quad +152 \quad +8y \quad +152$

$4y=120$

$\boxed{y=30}$

You try: $\frac{3}{x+5} + \frac{2}{x-5} = \frac{-4}{x^2-25}$

$(x+5)(x-5)$

$x \neq \pm 5$

LCD: $(x+5)(x-5)$

$\frac{3}{x+5} \cdot (x+5)(x-5) + \frac{2}{x-5} \cdot (x+5)(x-5) = \frac{-4}{((x+5)(x-5))} \cdot (x+5)(x-5)$

$3x-15+2x+10=-4$

$5x-5=-4$

$5x=1$

$x=\frac{1}{5}$