Practice
Solving Equations: Solving Equations Containing Fractions

Answer these problems, then check your answers using the key on the next page. If you missed something, look at the solutions after the answer key, and if you still don't understand, watch the review video again.

#1) Solve: $\frac{x+5}{8}=\frac{x-1}{4}$

#2) Solve: $\frac{7}{5x-2}=\frac{5}{4x}$

#3) Solve: $\frac{1}{x-1}+\frac{1}{2}=\frac{2}{x^2-1}$

#4) Solve: $\frac{5}{y+1}+\frac{3y+5}{y^2+4y+3}=\frac{2}{y+3}$

#5) Solve: $\frac{3}{x-2}-\frac{6}{x}=1$

#6) Solve: $\frac{2x+6}{9}+\frac{x+2}{3}=\frac{2}{9}$

Answers:

#1) $x = 7$

#2) $x = -\frac{10}{3}$

#3) $x = -3$

#4) no solution

#5) $x = 3$ *and* $x = -4$

#6) $x = -2$

Solutions:

#1) Solve: $\frac{x+5}{8} = \frac{x-1}{4}$

$\frac{(x+5)}{8} = \frac{(x-1)}{4}$

$4(x+5) = 8(x-1)$

$4x + 20 = 8x - 8$

$-4x \quad -4x$

$20 = 4x - 8$

$+8 \quad +8$

$28 = 4x$

$\frac{4x}{4} = \frac{28}{4}$

$\boxed{x = 7}$

#2) Solve: $\frac{7}{5x-2} = \frac{5}{4x}$

$\frac{7}{(5x-2)} = \frac{5}{4x}$

$5(5x-2) = 7(4x)$

$25x - 10 = 28x$

$-25x \quad -25x$

$\frac{-10}{3} = \frac{3x}{3}$

$\boxed{\frac{-10}{3} = x}$

#3) Solve: $\frac{1}{x-1} + \frac{1}{2} = \frac{2}{x^2-1}$

Factor $x^2 - 1$

$(x)^2 - (1)^2 = (x+1)(x-1)$ difference of squares

$\frac{1}{x-1} + \frac{1}{2} = \frac{2}{(x+1)(x-1)}$

list of factors: $x-1$, $x+1$, 2

$\frac{1(2)(x+1)(x-1)}{(x-1)} + \frac{1(2)(x+1)(x-1)}{2} = \frac{2(2)(x+1)(x-1)}{(x+1)(x-1)}$

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

$2x + 2 + x^2 - x + x - 1 = 4$

$x^2 + 2x + 1 = 4$

$-4 \quad -4$

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

Solve w/ trinomial factoring:

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

$(x-1)(x+3) = 0$

$x = 1$ or $x = -3$

-3	1
$1 \cdot -3$	-2
$-1 \cdot 3$	2

but $x = 1 \Rightarrow \frac{1}{(1)-1} + \frac{1}{2} = \frac{2}{(1)^2-1}$

$\frac{1}{0}$ so $x = 1$ not allowed

solution: $\boxed{x = -3}$

#4) Solve: $\frac{5}{y+1}+\frac{3y+5}{y^2+4y+3}=\frac{2}{y+3}$

$\frac{5}{(y+1)}+\frac{3y+5}{(y+1)(y+3)}=\frac{2}{(y+3)}$

LCD: $y+1$, $y+3$

$\frac{5(y+1)(y+3)}{(y+1)}+\frac{(3y+5)(y+1)(y+3)}{(y+1)(y+3)}=\frac{2(y+1)(y+3)}{(y+3)}$

$5(y+3)+3y+5=2(y+1)$

$5y+15+3y+5=2y+2$

$8y+20=2y+2$

$-2y \quad -2y$

$6y+20=2$

$-20 \quad -20$

$6y=-18$

$\frac{6y}{6}=\frac{-18}{6}$

$y=-3$

but plugging in $\frac{2}{y+3}$

$\frac{2}{(-3)+3}=\frac{2}{0}$

so no solution

#5) Solve: $\frac{3}{x-2}-\frac{6}{x}=1$

LCD: x, $x-2$

$\frac{3(x)(x-2)}{(x-2)}-\frac{6(x)(x-2)}{x}=1(x)(x-2)$

$3x-6(x-2)=x(x-2)$

$3x-6x+12=x^2-2x$

$-3x+12=x^2-2x$

$+3x \quad +3x$

$12=x^2+x$

$-12 \quad -12$

$x^2+x-12=0$

$(x-3)(x+4)=0$

$x-3=0 \quad x+4=0$

$x=3 \quad x=-4$

M	S
-12	
$1,-12$	-11
$-1,12$	11
$2,-6$	-4
$-2,6$	4
$3,-4$	7
$-3,4$	1 ←

#6) Solve: $\frac{2x+6}{9}+\frac{x+2}{3}=\frac{2}{9}$

LCD: 3, 9

$\frac{(2x+6)(3)(9)}{9}+\frac{(x+2)(3)(9)}{3}=\frac{2(3)(9)}{9}$

$3(2x+6)+9(x+2)=6$

$6x+18+9x+18=6$

$15x+36=6$

$-36 \quad -36$

$\frac{15x}{15}=\frac{-30}{15}$

$x=-2$