Unit VI – Second Degree Relations and Higher - Algebraic Fractions
Part B – Solving Open Sentences
Lesson 2 – Equations - Algebraic Case

Simplify each of the following complex fractions.

1. $\dfrac{2b+3}{b-1} - \dfrac{10}{b^2-1} = \dfrac{2b+3}{b+1}$

2. $\dfrac{x+1}{x-3} = \dfrac{3}{x} + \dfrac{12}{x^2-3x}$

3. $\dfrac{4}{y^2-8y+12} = \dfrac{y}{y-2} + \dfrac{1}{y-6}$

4. $\dfrac{2a-9}{a-7} + \dfrac{a}{2} = \dfrac{5}{a-7}$

5. $\dfrac{a-3}{3a} = \dfrac{1}{3a^2+9a} + \dfrac{1}{a+3}$

6. $\dfrac{2x-3}{x-5} = \dfrac{x}{x+4} + \dfrac{20x-37}{x^2-x-20}$

7. $\dfrac{8}{12+4x-x^2} + \dfrac{x+1}{6-x} = \dfrac{5}{x+2}$

8. $\dfrac{x-2}{x+1} = \dfrac{x-3}{x^2-5x-6} - \dfrac{2x-7}{x-6}$

9. $\dfrac{7y-20}{y^2-7y+12} = \dfrac{y}{y-3} - \dfrac{2}{4-y}$

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Simplify each of the following complex fractions.

1. $b = 1$

   However, in this problem $b \neq 1$ or $b \neq \bar{1}$
   (Restricted values) There is no solution

2. $x = \bar{1}$ or $x = 3$

   However, in this problem $x \neq 3$ or $x \neq 0$,
   (Restricted values) $x = \bar{1}$ is the only
   acceptable answer.

3. $\bar{1} = y$ or $6 = y$

   However, in this problem $y \neq 6$ or $y \neq 2$.
   (Restricted values) $y = \bar{1}$ is the only
   acceptable answer.

4. $a = 7$ or $a = \bar{4}$

   In this problem $a \neq 7$,
   (Restricted value) $a = \bar{4}$ is the only
   acceptable solution.

5. $a = 5$ or $a = \bar{2}$

   Restricted values are $a \neq 0$, $a \neq \bar{3}$
   So, both solutions are acceptable.

6. $x = 5$

   However, $x \neq 5$,
   (Restricted value) No Solution!

7. $x = \bar{1}0$ or $x = 2$

   x cannot equal 6 or $\bar{2}$, (Restricted Values)
   Therefore, the solution is $x = \bar{1}0$ or $x = 2$.

8. $x = \dfrac{2}{3}$ or $x = 4$

   $x \neq \bar{1}$ or 6, (Restricted Values)

   Therefore, the solutions are $x = \dfrac{2}{3}$ or $x = 4$.

9. $2 = y$ or $7 = y$

   Restricted values are $y \neq 3$ and $y \neq 4$.
   Therefore, the solution is $y = 2$ or $y = 7$.