

## Complex Fractions and Operations with Rational Expressions

1. a. Evaluate the rational expression  $\frac{1 + \frac{3}{k-1}}{2 + \frac{6}{k-1}}$  when:

(i)  $k = 2$       (ii)  $k = 0$       (iii)  $k = 4$       (iv)  $k = 2009$

b. Explain why the rational expression in part a is undefined when  $k = 1$  or  $k = -2$ .

In 2 – 9, simplify:

2.  $\frac{1}{2} + \frac{3}{4a^2} - \frac{1}{a}$

3.  $\frac{z + \frac{1}{5}}{z^2 - \frac{1}{25}}$

4.  $\frac{6 + \frac{12}{t}}{3t - \frac{12}{t}}$

5.  $\frac{3y+1}{y^2-16} + \frac{y-2}{2y+8}$

6.  $\frac{\frac{5}{x} - \frac{x}{5}}{1 + \frac{8}{x} + \frac{15}{x^2}}$

7.  $\frac{\frac{p}{p-1} + \frac{p}{p+1}}{\frac{p}{p+1}}$

8.  $\frac{x^2 - 4x - 32}{x^2 + 12x + 32} \div \frac{(x-8)^2}{x^2 - 64}$

9.  $\frac{3x^2 - 6x}{9x^2} \cdot \frac{4 - 9x^2}{3x^2 - 4x - 4}$