



Chapter 6.1, 6.2 & 6.3 Checkpoint (Version A)
You must show all your work clearly to receive full marks

1. Determine the non-permissible value(s) for each rational expression. [0.5 mark each]

(a) $\frac{7}{xy}$

$xy \neq 0$
 $x, y \neq 0$

(b) $\frac{2a}{a^2 - 3a} = \frac{2a}{a(a-3)}$

$a \neq 0, 3$

2. Simplify. State any non-permissible value(s). [0.5 mark each]

(a) $\frac{-x+2}{4x-8} = \frac{-(x-2)}{4(x-2)}$

$= \frac{-1}{4}, x \neq 2$

(b) $\frac{3x(4x-1)}{(4x-1)(3x+1)}$

$= \frac{3x}{3x+1}, x \neq \frac{1}{4}, -\frac{1}{3}$

3. Determine the product. State any non-permissible value(s). [2 marks]

$\left(\frac{5y-5}{y^2+4y-5}\right)\left(\frac{y^2-25}{y^2-2y-15}\right)$

$\frac{5}{4} \times \frac{-1}{-5}$
 $\frac{3}{-2} \times \frac{-5}{-5}$

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

$= \frac{5}{y+3}, y \neq 1, \pm 5, -3$

4. Determine the quotient. State any non-permissible value(s). [2 marks]

$\frac{4a}{3a-12} \div \frac{16a^2}{9a-36}$

$= \frac{4a}{3(a-4)} \div \frac{16a^2}{9(a-4)}$

$= \frac{4a(9)(a-4)}{3(a-4)(16a^2)} = \frac{(4)(a)(3)(3)(a-4)}{3(a-4)(4)(4)(a)(a)}$

$= \frac{3}{4a}, a \neq 4, 0$

5. Simplify each expression and state any non-permissible values.

[2 mark]

$$\begin{aligned}
 \frac{x}{x^2-3x-4} - \frac{4}{x+1} &= \frac{x}{(x+1)(x-4)} - \frac{4}{x+1} \left(\frac{x-4}{x-4} \right) \\
 &= \frac{x - 4(x-4)}{(x+1)(x-4)} = \frac{x - 4x + 16}{(x+1)(x-4)} \\
 &= \boxed{\frac{-3x+16}{(x+1)(x-4)}, x \neq -1, 4}
 \end{aligned}$$

6. Simplify each expression and state any non-permissible values.

[2 mark]

$$\begin{aligned}
 \frac{3x+1}{2x^2-2} + \frac{2x+2}{2x^2-8x+6} &= \frac{3x+1}{2(x^2-1)} + \frac{2(x+1)}{2(x^2-4x+3)} \\
 &= \frac{3x+1}{2(x+1)(x-1)} \left(\frac{x-3}{x-3} \right) + \frac{2(x+1)}{2(x-1)(x-3)} \left(\frac{x+1}{x+1} \right) \quad \text{LCD: } 2(x-1)(x-3)(x+1) \\
 &= \frac{(3x+1)(x-3) + 2(x+1)(x+1)}{2(x+1)(x-1)(x-3)} = \frac{3x^2 - 9x + x - 3 + 2(x^2 + 2x + 1)}{2(x+1)(x-1)(x-3)} \\
 &= \frac{3x^2 - 8x - 3 + 2x^2 + 4x + 2}{2(x+1)(x-1)(x-3)} = \frac{5x^2 - 4x - 1}{2(x+1)(x-1)(x-3)} \\
 &= \frac{(5x+1)(x-1)}{2(x+1)(x-1)(x-3)} = \frac{5x+1}{2(x+1)(x-3)}, x \neq \pm 1, 3
 \end{aligned}$$