

**GRADE 11 (MCR3U1)**

**SECONDARY SCHOOL**

**MATHEMATICS**

**TESTS AND EXAMS**

**(WITH COMPLETE SOLUTIONS)**

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# TEST #4

1. Simplify and state restrictions on the variables.

$$a) \frac{4}{8x-4}$$

$$e) \frac{x}{x+3} - \frac{x-3}{x}$$

$$b) \frac{2}{x} + \frac{5}{xy} + \frac{3}{y}$$

$$f) \frac{2}{3x+6} - \frac{4x}{x^2+2x}$$

$$c) 5 + \frac{2}{x-y}$$

$$g) \frac{x+1}{3x^2+6x+3} - \frac{1}{x^2+9x+8}$$

$$d) \frac{5}{x^2-16} + \frac{2}{x^2-4x}$$

$$h) \frac{5}{x^2+x-6} - \frac{3}{x^2-4x+4}$$

2. Simplify and state restrictions on the variables.

$$a) \frac{x^2-5x-14}{x^2+6x+9} \cdot \frac{x^2-9}{3x-21}$$

$$b) \frac{x^2+10x+25}{x^2-9} \div \frac{5x+25}{2x-6}$$

$$c) \frac{3x-4}{2x^2+3x-9} \cdot \frac{4x^2-12x+9}{6x-8}$$

$$d) \frac{x^2-1}{x^2+2x-3} \cdot \frac{x-2}{x} + \frac{x+2}{x+3}$$

$$e) \frac{x^2+3x-10}{x^2-4x+4} \div \frac{x^2+2x-15}{3x-6} + \frac{2}{x+3}$$

$$f) \frac{3x}{x^2+x-2} - \frac{4}{x^2-4x+3} - \frac{10}{x^2-x-6}$$

# TEST 4 Solutions

$$1a) \frac{4}{8x-4}$$

$$= \frac{4}{4(2x-1)}$$

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

$$b) \frac{2}{x} + \frac{5}{xy} + \frac{3}{y}$$

$$= \frac{2y + 5 + 3x}{xy}, x \neq 0, y \neq 0$$

$$c) 5 + \frac{2}{x-y}$$

$$= \frac{5(x-y) + 2}{x-y}$$

$$= \frac{5x - 5y + 2}{x-y}, x \neq y$$

$$d) \frac{5}{x^2-16} + \frac{2}{x^2-4x}$$

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

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

$$= \frac{5x + 2x + 8}{x(x+4)(x-4)}$$

$$= \frac{7x + 8}{x(x+4)(x-4)}, x \neq 0, -4, 4$$

$$e) \frac{x}{x+3} - \frac{x-3}{x}$$

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

$$= \frac{x^2 - [x^2 - 3x + 3x - 9]}{x(x+3)}$$

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

$$= \frac{9}{x(x+3)}, x \neq 0, -3$$

$$f) \frac{2}{3x+6} - \frac{4x}{x^2+2x}$$

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

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

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

$$= \frac{-10}{3(x+2)}, x \neq -2$$

# TEST 4 Solutions

$$\begin{aligned}
 \text{g)} \quad & \frac{x+1}{3x^2+6x+3} - \frac{1}{x^2+9x+8} \\
 &= \frac{x+1}{3[x^2+2x+1]} - \frac{1}{(x+1)(x+8)} \\
 &= \frac{\cancel{x+1}}{3(x+1)\cancel{(x+1)}} - \frac{1}{(x+1)(x+8)} \\
 &= \frac{1}{3(x+1)} - \frac{1}{(x+1)(x+8)} \\
 &= \frac{1(x+8) - 1(3)}{3(x+1)(x+8)} \\
 &= \frac{x+8-3}{3(x+1)(x+8)} \\
 &= \frac{x+5}{3(x+1)(x+8)}, \quad x \neq -1, -8
 \end{aligned}$$

$$\begin{aligned}
 \text{h)} \quad & \frac{5}{x^2+x-6} - \frac{3}{x^2-4x+4} \\
 &= \frac{5}{(x+3)(x-2)} - \frac{3}{(x-2)(x-2)} \\
 &= \frac{5(x-2) - 3(x+3)}{(x+3)(x-2)(x-2)} \\
 &= \frac{5x-10-3x-9}{(x+3)(x-2)(x-2)} \\
 &= \frac{2x-19}{(x+3)(x-2)(x-2)}
 \end{aligned}$$