Rational Expressions – Multiply/Divide

Algorithm

1. **factor the numerators and denominator**
2. **invert the divisor , if its division**
3. **divide out common factors**

Example $\dfrac{x^2-1}{x^2+7x+10} \div \dfrac{x^2+2x-3}{x^2+10x+16}$

1. $\dfrac{(x+1)(x-1)}{(x+5)(x+2)} \div \dfrac{(x-1)(x+3)}{(x+2)(x+8)}$

2. $\dfrac{(x+1)(x-1)}{(x+5)(x+2)} * \dfrac{(x+2)(x+8)}{(x-1)(x+3)}$

3. $\dfrac{(x+1)\cancel{(x-1)}}{(x+5)\cancel{(x+2)}} * \dfrac{\cancel{(x+2)}(x+8)}{\cancel{(x-1)}(x+3)} = \dfrac{(x+1)(x+8)}{(x+5)(x+3)}$

Simplify the following rational expressions.

1. $\dfrac{x^2-4}{x^2+5x+6} \cdot \dfrac{x^2-9}{x^2+4x+3}$

2. $\dfrac{x^2+7x+12}{x^2+9x+20} \cdot \dfrac{x^2+7x+10}{x^2-16}$

3. $$\frac{x^2+11x+10}{x^2-3x-4} \cdot \frac{x^2-7x+12}{x^2+8x-20}$$

4. $$\frac{x^2+4x-12}{x^2-8x+12} \cdot \frac{x^2-4}{x^2+2x}$$

5. $$\frac{2x^2+x-3}{2x^2+7x+6} \div \frac{x^2-2x+1}{x^2-4}$$

6. $$\frac{4x^2+3x-1}{x^2-1} \div \frac{16x^2-1}{x^2-1}$$

7. $$\frac{6x^2-5x-6}{10x^2-13x-3} \div \frac{3x^2+14x+8}{5x^2+6x+1}$$