

31.

$$\frac{x+5}{x-5} \cdot \frac{2x^2-9x-5}{3x^2+x-2} \cdot \frac{x^2-1}{x^2+7x+10}$$

$$\frac{\cancel{x+5} \cdot \cancel{(2x+1)} \cancel{(x-5)}}{\cancel{x-5} \cdot \cancel{(3x+2)} \cancel{(x-1)}} \cdot \frac{\cancel{(x+1)} \cancel{(x-1)}}{\cancel{(x+5)} \cancel{(x+2)}}$$

$$\frac{(2x+1)(x+1)}{(3x+2)(x+2)}$$

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$$\frac{\frac{x^2-4}{x-7}}{\frac{3x+6}{x^2-6x-7}}$$

$$\frac{x^2-4}{x-7} \cdot \frac{x^2-6x-7}{3x+6}$$

$$\frac{\cancel{(x+2)}(x-2)}{\cancel{x-7}} \cdot \frac{\cancel{(x-7)}(x+1)}{3\cancel{(x+2)}}$$
$$\frac{(x-2)(x+1)}{3}$$

7.3 adding + subtracting rational expressions

To add or subtract:

- ① Factor the denominators (not the numerators!)
- ② Get a common denominator
- ③ Combine the expressions
- ④ factor the numerator
- ⑤ cancel

$$\text{Ex: } \frac{x}{4} + \frac{5-x}{4} = \frac{5}{4}$$

$$\text{Ex: } \frac{x}{x^2 - 2xy - 3y^2} - \frac{3y}{x^2 - 2xy - 3y^2}$$

$$\frac{x}{(x-3y)(x+y)} - \frac{3y}{(x-3y)(x+y)}$$

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

Finding the LCD:

The least common multiple of the denominators and is the simplest polynomial that is a multiple of each denominator.

Find the LCM of:

$$\underline{6x}, \underline{2x^2}$$

$$\textcircled{6x^2}$$

$$x^2 - x, 2x - 2$$

$$\underline{\cancel{x(x-1)}}, \underline{\cancel{2(x-1)}}$$

$$2x(x-1)$$

$$\text{Ex: } 3x^2 + 6x, x^2 + 4x + 4$$

$$\underline{\cancel{3x(x+2)}}, \underline{\cancel{(x+2)(x+2)}}$$

$$3x \underline{(x+2)(x+2)}$$

$$\frac{7(4)}{6x(4)} + \frac{5(3)}{8x(3)}$$

$$\frac{28}{24x} + \frac{15}{24x} = \frac{43}{24x}$$

Ex: $\frac{3(x+2)}{(x-3)(x+2)} - \frac{5(x-3)}{(x+2)(x-3)}$

$3x, 2x$
 ~~$x-3, x+2$~~
 $(x-3)(x+2)$

$$\frac{3x+6}{(x-3)(x+2)} - \frac{5x-15}{(x-3)(x+2)}$$

$$\frac{-2x+21}{(x-3)(x+2)}$$

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2-50 even,
skip 28-32 odds E.C.