

8.5 Adding and subtracting rational expressions

The key to adding and or subtracting rational expressions is COMMON DENOMINATORS!!!

ex.1: $\frac{3}{x^2} + \frac{5}{x^2} = \frac{8}{x^2}$

Domain restrictions:

$$x \neq 0$$

ex.2: $\frac{2x}{x+3} + \frac{5}{x+3} = \frac{2x+5}{x+3}$

Domain restrictions: $x \neq -3$

ex.3: $\frac{x^2 - 9}{x-3} = \frac{x^2 - 9}{x-3} = \frac{(x+3)(x-3)}{x-3}$ *Don't forget simplify*

Domain restrictions:

$$x \neq 3$$

$$\boxed{x+3, x \neq 3}$$

ex.4: $\frac{3x-1}{2x-1} - \frac{5+2x}{2x-1} = \frac{3x-1 - (5+2x)}{2x-1} = \frac{3x-1-5-2x}{2x-1}$

Domain restrictions:

$$\begin{aligned} 2x-1 &\neq 0 \\ 2x &\neq 1 \\ x &\neq \frac{1}{2} \end{aligned}$$

$$= \boxed{\frac{x-6}{2x-1}, x \neq \frac{1}{2}}$$

ex.5: $\frac{2x}{x-5} - \frac{10}{x-5} = \frac{2x-10}{x-5} = \frac{2(x-5)}{x-5}$

Domain restrictions:

$$x \neq 5$$

$$= \boxed{2, x \neq 5}$$

Combine, simplify and state domain restrictions:

ex.6 $\frac{x}{x+6} + \frac{72}{x^2-36}$

$$\frac{x \cdot (x-6)}{(x+6)(x-6)} + \frac{72}{(x+6)(x-6)}$$

$$= \frac{x^2 - 6x + 72}{(x+6)(x-6)}, x \neq \pm 6$$

$$\frac{x^2 - 6x + 72}{x^2 - 36}; x \neq \pm 6$$

1 · 72
2 · 36
4 · 18
6 · 12

2 · 2 · 2 · 3 · 3

Ex 7 $\frac{3x}{x-1} \ominus \frac{x-2}{x^2-x}$

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

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

$$= \frac{3x^2 - x + 2}{x(x-1)}, x \neq 0, 1 \text{ can this be simplified?}$$

NO

~~6~~
-1
Nothing ↗