

Adding & Subtracting Wth Unlike Denominators

old Example: $\frac{3 \cdot 2}{3 \cdot 3} + \frac{4}{9} \Rightarrow \frac{6}{9} + \frac{4}{9} = \boxed{\frac{10}{9}}$

3: 3, 6, (9), 12

9: (9), 18, 27

Steps

- ① Factor the denominator if needed
- ② Find LCD (least common denominator)
- ③ Change the fractions into common denominators by multiplying
- ④ Add or subtract

Ex 1 $\frac{2 \cdot 5m}{2 \cdot 2m} - \frac{3n}{4m} = \frac{10m}{4m} - \frac{3n}{4m} = \boxed{\frac{10m - 3n}{4m}}$

Restrictions $\frac{4m}{4} = \frac{0}{4}$
 $m = 0$

$m \neq 0$

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

Restrictions $x+1 = 0$
 $x = -1$

$x \neq -1$

Ex 3

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

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

$$\sqrt{x^2} = x$$

$$\sqrt{1} = 1$$

Restrictions

$$\begin{array}{r} x-1=0 \\ +1 \quad +1 \\ \hline x=1 \end{array} \quad \begin{array}{r} x+1=0 \\ -1 \quad -1 \\ \hline x=-1 \end{array}$$

$$= \frac{2}{(x-1)(x+1)} \quad (x \neq 1, -1)$$

Review for Quiz

① $\frac{x^2-2x-15}{x^2-6x+5} = \frac{(x+3)(x-5)}{(x-1)(x-5)} = \frac{x+3}{x-1}$

$x \neq 1, 5$

Restrictions

$$\begin{array}{r} x-1=0 \\ +1 \quad +1 \\ \hline x=1 \end{array} \quad \begin{array}{r} x-5=0 \\ +5 \quad +5 \\ \hline x=5 \end{array}$$

② $\frac{b^2-2b-15}{8b+20} \div \frac{2}{4b+10} = \frac{b^2-2b-15}{8b+20} \cdot \frac{4b+10}{2}$

Keep change flip!

$$\frac{(b+3)(b-5)}{4(2b+5)} \cdot \frac{2(2b+5)}{2} = \frac{(b+3)(b-5)}{4} \quad (b \neq -\frac{5}{2})$$

Restrictions

$$2b+5=0 \quad -5$$

$$2b = -5$$

$$b = -\frac{5}{2}$$

$$\textcircled{3} \quad \frac{x-3}{2x+1} - \frac{2x-1}{2x+1} = \frac{x-3-2x+1}{2x+1} = \boxed{\frac{-x-2}{2x+1}}$$

Restrictions

$$\begin{array}{r} 2x+1=0 \\ \hline -1 \quad -1 \\ \hline 2x = -1 \\ \frac{2x}{2} = \frac{-1}{2} \end{array}$$

$$\boxed{x \neq -\frac{1}{2}}$$