

Fractions

Simplify (i) $\frac{10}{12} = \frac{2(5)}{2(6)} = \frac{5}{6}$

(ii) $\frac{6x+10}{15x+25} = \frac{2(3x+5)}{5(3x+5)}$

(iii) $= \frac{2}{5}$
 $\frac{x^2-5x+6}{x^2-9}$

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

$$\begin{aligned} x^2-5x+6 \\ x^2-2x-3x+6 \\ x(x-2)-3(x-2) \end{aligned}$$

$$\frac{2}{3} \times \frac{5}{7} = \frac{10}{21}$$

$$\frac{2}{3} \div \frac{5}{7} = \frac{2}{3} \times \frac{7}{5}$$

$$\frac{\frac{2}{3}}{\frac{5}{7}} = \frac{2}{3} \cdot \frac{7}{5}$$

Simplify

$$\frac{3x^2 - 27}{4x^2 - 15x + 9} \times \frac{4x - 3}{x^2 + 3x}$$

$$\frac{\cancel{3}^1}{\cancel{4}_1} \times \frac{\cancel{8}^2}{\cancel{9}_3} = \frac{24}{36}$$

$$\frac{3}{4} \times \frac{2(4)}{3(3)} = \frac{\cancel{3}(2)(\cancel{4})}{\cancel{4}(\cancel{3})(3)}$$

$$3x^2 - 27 = 3(x^2 - 9)$$

$$3(x-3)(x+3)$$

$$4x^2 - 15x + 9 \quad \begin{array}{l} \text{LN } 36 \\ \text{Add } 15 \end{array}$$

$$4x^2 - 12x - 3x + 9$$

$$4x(x-3) - 3(x-3)$$

$$(x-3)(4x-3)$$

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

Add / Subtract

Simplify (1) $\frac{1}{2} + \frac{1}{3} = \frac{3+2}{6}$
 $= \frac{5}{6}$

numerator
denominator

$$(ii) \quad \frac{3}{4} + \frac{5}{6} = \frac{9+10}{12}$$
$$\frac{3}{(2)(2)} + \frac{5}{2(3)} = \frac{19}{12}$$

Simplify \rightarrow

$$(i) \quad \frac{5}{2x+1} + \frac{7}{3x-4}$$

$$\frac{5(3x-4) + 7(2x+1)}{(2x+1)(3x-4)}$$

$$\frac{15x-20 + 14x + 7}{(2x+1)(3x-4)}$$

$$\frac{29x-13}{(2x+1)(3x-4)}$$

$$(ii) \quad \frac{4}{x^2-9} + \frac{7}{x^2-5x+6}$$

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

$$\frac{4(x-2) + 7(x+3)}{(x-3)(x+3)(x-2)}$$

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

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Show $\frac{x}{x-3} + \frac{3}{3-x}$ simplifies to a constant for all $x \in \mathbb{R}$, $x \neq 3$.

$$x \qquad \frac{1}{x}$$

$$1 \qquad 1$$

$$0.1 \qquad \frac{1}{0.1} = 10$$

$$0.01 \qquad \frac{1}{0.01} = 100$$

$$0.001 \qquad = 1000$$

$$0.0001 \qquad = 10,000$$

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

$$\frac{x-3}{x-3} = 1$$

$x \in \mathbb{N}$ = Natural = whole +

$x \in \mathbb{Z}$ = Integer = whole +/-

$x \in \mathbb{Q}$ = Rational = $\frac{p}{q}$

$x \in \mathbb{R}$ = Real = any

Simplify

$$\frac{1 + \frac{1}{2}}{2 + \frac{1}{3}} = \frac{\frac{2+1}{2}}{\frac{6+1}{3}} = \frac{\frac{3}{2}}{\frac{7}{3}}$$

$$\frac{1\frac{1}{2}}{2\frac{1}{3}}$$

$$\frac{3}{2} \times \frac{3}{7} = \frac{9}{14}$$

$$\frac{\frac{3}{2}}{\frac{7}{3}} \cdot \frac{\frac{3}{3}}{\frac{2}{2}}$$

$$\frac{\frac{9}{2}}{\frac{7}{3}} \cdot \frac{\frac{3}{3}}{\frac{2}{2}}$$

Simplify

$$\frac{5 + \frac{3}{x}}{7 - \frac{4}{x}} \cdot \frac{x}{x} = \frac{5x+3}{7x-4}$$

$$\frac{5}{1} + \frac{3}{x} = \frac{5x+3}{x}$$

$$\frac{7}{1} - \frac{4}{x} = \frac{7x-4}{x}$$

$$\frac{5x+3}{\cancel{x}} \cdot \frac{\cancel{x}}{7x-4} = \frac{5x+3}{7x-4}$$

Simplify

$$\frac{5 - \frac{1}{x+2}}{\frac{7}{x+2} - 6}$$

$$\frac{5}{1} - \frac{1}{x+2} = \frac{5(x+2)-1}{x+2} = \frac{5x+9}{x+2}$$

$$\frac{7}{x+2} - \frac{6}{1} = \frac{7-6(x+2)}{x+2} = \frac{-6x-5}{x+2}$$

$$\frac{5x+9}{x+2} \cdot \frac{x+2}{-6x-5}$$
$$\frac{5x+9}{-6x-5}$$

Simplify

$$\frac{x}{x-7} + \frac{7}{7-x}$$

$$x \in \mathbb{R}, x \neq 7$$

$$\frac{x-7}{x-7} = 1$$

$$(7-x)(-1) = x-7$$

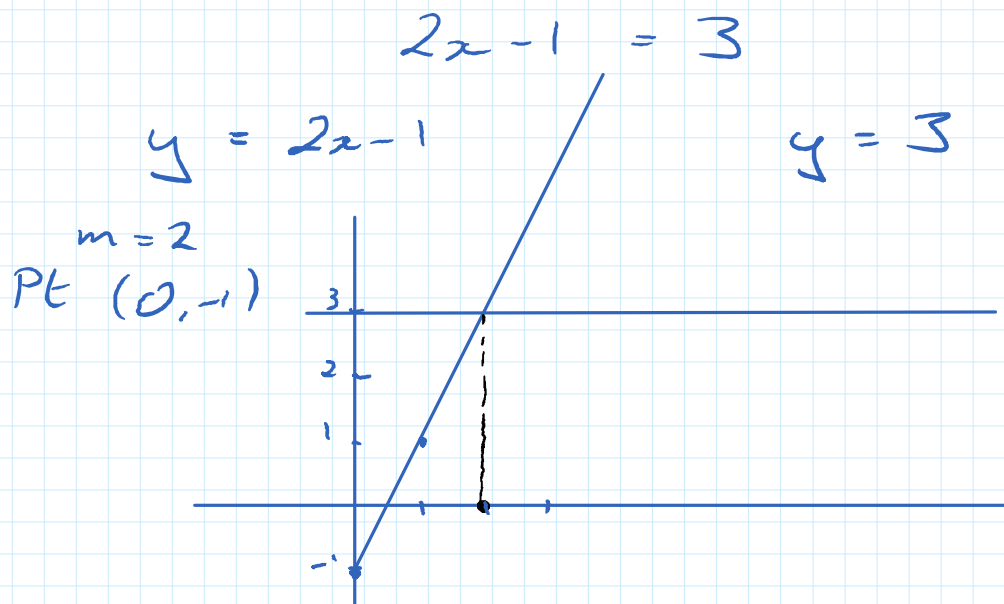
Equations.

Solve $2x-1=3$

$$2x-1+1 = 3+1$$

$$\frac{2x}{2} = \frac{4}{2} \Rightarrow x = 2$$

$$2x-1 = 3$$



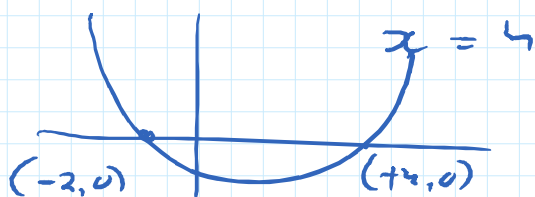
Solve

$$x^2 - 2x - 8 = 0 \quad \text{LN } -8$$

$$x^2 - 4x + 2x - 8 = 0 \quad \text{Sub } -2$$

$$x(x - 4) + 2(x - 4) = 0$$

$$(x - 4)(x + 2) = 0$$



$x = 4$ $x = -2$
Roots.