More Algebraic Fractions

Examples

1) $$\frac{3x+2}{4} + \frac{2x-1}{3} = \frac{3(3x+2)+4(2x-1)}{12}$$

$$= \frac{9x+6+8x-4}{12}$$

$$= \frac{17x+2}{12}$$

2) $$\frac{x+7}{5} - \frac{3x-1}{6} = \frac{6(x+7)-5(3x-1)}{30}$$

$$= \frac{6x+42-15x+5}{30}$$

$$= \frac{-9x+47}{30}$$

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

$$= \frac{15x+5+2x-4}{(x-2)(3x+1)}$$

$$= \frac{17x+1}{(x-2)(3x+1)}$$

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

$$= \frac{7x - 14 - 3x - 3}{(x+1)(x-2)}$$

$$= \frac{4x - 17}{(x+1)(x-2)}$$

---

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

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

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

Classwork

1) $$\frac{2x+3}{4} + \frac{x-1}{5} = \frac{5(2x+3) + 4(x-1)}{20}$$

$$= \frac{10x + 15 + 4x - 4}{20}$$

$$= \frac{14x + 11}{20}$$

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

$= \frac{9x-3-4x-10}{6}$

$= \frac{5x-13}{6}$

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

$= \frac{9x-3+2x+8}{(x+4)(3x-1)}$

$= \frac{11x+5}{(x+4)(3x-1)}$

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

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

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

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

$$= \frac{x^2+5x+4+x^2+5x+6}{(x+2)(x+4)}$$

$$= \frac{2x^2+10x+10}{(x+2)(x+4)}$$

or $$\frac{2(x^2+5x+5)}{(x+2)(x+4)}$$

Multiplication and Division

Examples

1) $$\frac{\cancel{10}^{1}}{(x+2)\cancel{(x+3)}} \times \frac{\cancel{(x+3)}(x+4)}{\cancel{20}_{2}} = \frac{x+4}{2(x+2)}$$

2) $$\frac{15}{x^2+6x+5} \times \frac{x^2+7x+10}{20}$$

$$= \frac{\cancel{15}^{3}}{(x+1)\cancel{(x+5)}} \times \frac{(x+2)\cancel{(x+5)}}{\cancel{20}_{4}} = \frac{3(x+2)}{4(x+1)}$$

3) $$\frac{x^2-16}{5} \times \frac{10}{x^2-3x-4}$$

$$= \frac{(x+4)\cancel{(x-4)}}{\cancel{5}_{1}} \times \frac{\cancel{10}^{2}}{(x+1)\cancel{(x-4)}} = \frac{2(x+4)}{x+1}$$

Classwork

1) $$\frac{2x+6}{4} \times \frac{4}{x^2+6x+9} = \frac{2\cancel{(x+3)}}{\cancel{4}_1} \times \frac{\cancel{4}^1}{(x+3)\cancel{(x+3)}}$$

$$= \frac{2}{x+3}$$

2) $$\frac{x^2-4}{3} \times \frac{9}{x^2+3x+2} = \frac{\cancel{(x+2)}(x-2)}{\cancel{3}_1} \times \frac{\cancel{9}^3}{(x+1)\cancel{(x+2)}}$$

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

3) $$\frac{5x+10}{7} \times \frac{14}{3x+6} = \frac{5\cancel{(x+2)}}{\cancel{7}_1} \times \frac{\cancel{14}^2}{3\cancel{(x+2)}}$$

$$= \frac{10}{3}$$

Division

1) $$\frac{x^2+5x+6}{4} \div \frac{x^2+7x+12}{8}$$

$$\frac{x^2+5x+6}{4} \times \frac{8}{x^2+7x+12}$$

$$= \frac{(x+2)\cancel{(x+3)}}{\cancel{4}_{1}} \times \frac{\cancel{8}^{2}}{\cancel{(x+3)}(x+4)} = \frac{2(x+2)}{x+4}$$

2) $$\frac{x^2-16}{3} \div \frac{x^2+9x+20}{6}$$

$$= \frac{x^2-16}{3} \times \frac{6}{x^2+9x+20}$$

$$= \frac{\cancel{(x+4)}(x-4)}{\cancel{3}_{1}} \times \frac{\cancel{6}^{2}}{\cancel{(x+4)}(x+5)} = \frac{2(x-4)}{x+5}$$
