Adding and subtracting algebraic fractions

ANSWERS

1

Write as a single fraction $\frac{x}{2} + \frac{x}{5}$

cut both bars into 10 equal pieces



make the denominators the same

$$\frac{x \times 5}{2 \times 5} + \frac{x \times 2}{5 \times 2}$$

now add or subtract the numerators

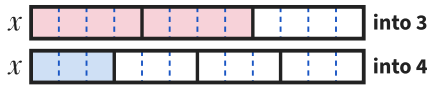
$$= \frac{5x + 2x}{10}$$

Answer $\frac{7x}{10}$

2

Write as a single fraction $\frac{2x}{3} + \frac{x}{4}$

cut both bars into 12 equal pieces



make the denominators the same

$$\frac{2x \times 4}{3 \times 4} + \frac{x \times 3}{4 \times 3}$$

now add or subtract the numerators

$$= \frac{8x + 3x}{12}$$

Answer $\frac{11x}{12}$

3

Write as a single fraction $\frac{3x}{5} - \frac{x}{4}$

make the denominators the same

$$\frac{3x \times 4}{5 \times 4} - \frac{x \times 5}{4 \times 5}$$

now add or subtract the numerators

$$= \frac{12x - 5x}{20}$$

Answer $\frac{7x}{20}$

4

Write as a single fraction

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

make the denominators the same

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

now add or subtract the numerators

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

expand and collect the numerator

$$= \frac{7x + 5}{12}$$

Answer $\frac{7x + 5}{12}$

5

Write as a single fraction

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

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

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

$$= \frac{7x + 17}{15}$$

Answer $\frac{7x + 17}{15}$

6

Write as a single fraction

$\frac{2}{x+1} + \frac{5}{x+3}$

make the denominators the same

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

now add or subtract the numerators

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

expand and collect the numerator

$$= \frac{7x + 11}{(x+1)(x+3)}$$

Answer $\frac{7x + 11}{(x+1)(x+3)}$

7

Write as a single fraction

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

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

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

Answer $\frac{2x + 14}{(x-2)(x+4)}$

8

Leah writes $\frac{x}{4} + \frac{x}{6} = \frac{2x}{10}$. Put $x = 12$ into both sides to show she is wrong. Then write the right answer.

$3 + 2 = 5$, but $\frac{24}{10} = 2.4$

$$\frac{3x}{12} + \frac{2x}{12}$$

Answer $\frac{5x}{12}$

Adding and subtracting algebraic fractions *further practice*

ANSWERS

9

Write as a single fraction

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

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

$\frac{3x+12+10x-5}{15}$

Answer $\frac{13x+7}{15}$

10

Write as a single fraction $\frac{5}{x}+\frac{2}{x-3}$

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

Answer $\frac{7x-15}{x(x-3)}$

11

A rectangle is $\frac{x}{3}$ cm long and $\frac{x+2}{4}$ cm wide. Write its perimeter as a single fraction.

$\frac{x}{3}+\frac{x+2}{4}=\frac{7x+6}{12}$

$\times 2$

Answer $\frac{7x+6}{6}$ cm

12

Show that $\frac{x+1}{2}-\frac{x-1}{3}=\frac{x+5}{6}$

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

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

Answer shown

13

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

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

$3x+1=16$

Answer $x=5$

14

Find the mean of $\frac{x}{2}$ and $\frac{x+4}{3}$.

Write it as a single fraction.

$\frac{x}{2}+\frac{x+4}{3}=\frac{5x+8}{6}$

halve it

Answer $\frac{5x+8}{12}$

15

Ravi writes $\frac{5}{x+1}-\frac{2}{x-3}$ as $\frac{5x-15-2x+2}{(x+1)(x-3)}$. Find his mistake and write the right answer.

$-2(x+1)=-2x-2$, not $-2x+2$

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

16

Solve $\frac{2}{x}+\frac{6}{x+3}=1$

$2(x+3)+6x=x(x+3)$

$x^2-5x-6=0,\ (x-6)(x+1)=0$

Answer $x=6$ or $x=-1$