Adding and subtracting algebraic fractions

ANSWERS

1

Write $\frac{2}{x+3} + \frac{1}{5}$ as a single fraction.

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

$= \frac{10 + (x+3)}{5(x+3)}$

$= \frac{10 + x + 3}{5(x+3)}$

Answer $\frac{x+13}{5(x+3)}$

2

Write $\frac{4}{x+1} + \frac{1}{2}$ as a single fraction.

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

$= \frac{8 + (x+1)}{2(x+1)}$

$= \frac{8 + x + 1}{2(x+1)}$

Answer $\frac{x+9}{2(x+1)}$

3

Write $\frac{1}{x+2} + \frac{3}{4}$ as a single fraction.

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

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

$= \frac{4 + 3x + 6}{4(x+2)}$

Answer $\frac{3x+10}{4(x+2)}$

4

Write $\frac{5}{x+2} + \frac{1}{4}$ as a single fraction.

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

$= \frac{20 + (x+2)}{4(x+2)}$

$= \frac{20 + x + 2}{4(x+2)}$

Answer $\frac{x+22}{4(x+2)}$

5

Write $\frac{2}{x+1} + \frac{3}{x+4}$ as a single fraction.

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

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

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

Answer $\frac{5x+11}{(x+1)(x+4)}$

6

Write $\frac{4}{x+2} + \frac{1}{x+3}$ as a single fraction.

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

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

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

Answer $\frac{5x+14}{(x+2)(x+3)}$

7

Write $\frac{3}{x+1} - \frac{2}{x+5}$ as a single fraction.

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

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

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

Answer $\frac{x+13}{(x+1)(x+5)}$

8

Ali writes

$\frac{6}{x+2} - \frac{1}{x+3} = \frac{6x+18-x+2}{(x+2)(x+3)}$.

Explain the mistake. Write the right single fraction.

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

$= \frac{6x + 18 - x - 2}{(x+2)(x+3)}$

Answer $\frac{5x+16}{(x+2)(x+3)}$

Adding and subtracting algebraic fractions *further practice*

ANSWERS

9

Write $\frac{1}{x+3} + \frac{2}{7}$ as a single fraction.

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

$= \frac{7 + 2x + 6}{7(x+3)}$

Answer $\frac{2x+13}{7(x+3)}$

10

Write $\frac{5}{x+1} + \frac{2}{x+3}$ as a single fraction.

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

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

Answer $\frac{7x+17}{(x+1)(x+3)}$

11

Write $\frac{4}{x+2} - \frac{3}{x+5}$ as a single fraction.

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

$= \frac{4x + 20 - 3x - 6}{(x+2)(x+5)}$

Answer $\frac{x+14}{(x+2)(x+5)}$

12

Write $\frac{2}{x} + \frac{3}{x+1}$ as a single fraction.

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

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

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

13

A rectangle is $\frac{2}{x+1}$ cm long and $\frac{1}{x+2}$ cm wide. Write its perimeter as a single fraction.

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

perimeter: 2 × that

Answer $\frac{6x+10}{(x+1)(x+2)}$ cm

14

Write $\frac{3}{x-1} + \frac{2}{x+2}$ as a single fraction.

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

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

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

15

$\frac{2}{x+1} + \frac{3}{x+2} = \frac{ax+b}{(x+1)(x+2)}$.

Find the values of a and b.

$2x + 4 + 3x + 3 = 5x + 7$

Answer $a = 5, b = 7$

16

Kim says $\frac{1}{x+1} - \frac{1}{x+2}$ is negative for some positive values of x.

Is she right? Explain.

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

both brackets are positive, so it is positive

Answer No