

Add and subtract simple algebraic fractions

H



1 Work out the calculations.

a) $\frac{1}{3} + \frac{1}{3} = \boxed{\frac{2}{3}}$

$\frac{1}{29} + \frac{1}{29} = \boxed{\frac{2}{29}}$

$\frac{1}{15} + \frac{1}{15} = \boxed{\frac{2}{15}}$

$\frac{1}{x} + \frac{1}{x} = \boxed{\frac{2}{x}}$

b)

To double a fraction you just double the numerator.

Do you agree with Alex? yes
Explain your answer.



2 Work out the calculations.

a) $\frac{1}{5} + \frac{1}{5} = \boxed{\frac{2}{5}}$

b) $\frac{1}{2} + \frac{1}{4} = \boxed{\frac{3}{4}}$ $\frac{2}{4} + \frac{1}{4}$

$\frac{6}{5} + \frac{6}{5} = \boxed{\frac{12}{5}}$

$\frac{1}{5} + \frac{1}{10} = \boxed{\frac{3}{10}}$ $\frac{2}{10} + \frac{1}{10}$

$\frac{29}{5} + \frac{29}{5} = \boxed{\frac{58}{5}}$

$\frac{1}{29} + \frac{1}{58} = \boxed{\frac{3}{58}}$ $\frac{2}{58} + \frac{1}{58}$

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

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

3 Annie is calculating with algebraic fractions.

I can work out $\frac{1}{k} + \frac{1}{k}$ because the denominator is the same, so $\frac{1}{k} + \frac{1}{k} = \frac{1+1}{k} = \frac{2}{k}$



Use Annie's method to complete the calculations.

a) $\frac{3}{m} + \frac{4}{m} = \boxed{\frac{7}{m}}$

c) $\frac{1}{p} - \frac{4}{p} = \boxed{-\frac{3}{p}}$

b) $\frac{12}{n} - \frac{5}{n} = \boxed{\frac{7}{n}}$

4 Here is an algebraic expression.

$\frac{4}{r} + \frac{2}{r}$

a) Write the expression as a single fraction.

$\boxed{\frac{6}{r}}$

b) Evaluate the expression when $r = 2$

$\boxed{3}$

c) For what value of r is $\frac{4}{r} + \frac{2}{r} > 1$?

e.g. $\boxed{4}$

Is there more than one answer?



- 5 Simplify the expressions.

$$\text{a) } \frac{1}{x} + \frac{1}{3x} = \boxed{\frac{4}{3x}}$$

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

$$\text{b) } \frac{2}{x} - \frac{3}{5x} = \boxed{\frac{7}{5x}}$$

$\frac{10}{5x} - \frac{3}{5x}$

Discuss your method with a partner.

- 6 The number line shows 0 and x .



Position the expressions on the number line.

Write a simplified fraction where required.

a) $2x$

c) $\frac{x}{4}$

$$\text{e) } \frac{2x}{1} - \frac{3x}{4} = \boxed{\frac{5x}{4}}$$

$\frac{8x}{4} - \frac{3x}{4}$

b) $\frac{x}{2}$

$$\text{d) } \frac{x}{2} + \frac{x}{4} = \boxed{\frac{3x}{4}}$$

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

$$\text{f) } \frac{x}{1} + \frac{x}{2} = \boxed{\frac{3x}{2}}$$

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

- 7 a) A sequence starts at zero and goes up by $\frac{a}{5}$ each term.

Write the first five terms of the sequence.

0, $\frac{a}{5}$, $\frac{2a}{5}$, $\frac{3a}{5}$, $\frac{4a}{5}$

- b) Another sequence starts at zero and goes up by $\frac{2a}{5}$ each term.

Write the first five terms of this sequence.

0, $\frac{2a}{5}$, $\frac{4a}{5}$, $\frac{6a}{5}$, $\frac{8a}{5}$

- 8 Simplify the expressions using equivalent fractions.

$$\text{a) } \frac{x}{2} + \frac{x}{3} = \boxed{\frac{5x}{6}}$$

$$\text{b) } \frac{2x}{3} - \frac{x}{2} = \boxed{\frac{x}{6}}$$

- 9 Solve the equations. Show all of your working.

$$\text{a) } \frac{1}{x} + \frac{3}{x} = 1$$

$$x = \boxed{4}$$

$$\text{b) } \frac{3}{y} + \frac{5}{y} = 1$$

$$y = \boxed{8}$$

$$\text{c) } \frac{11}{z} - \frac{9}{2z} = 1$$

$$z = \boxed{6.5}$$

- 10 How would you simplify these expressions?

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

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