

Add and subtract simple algebraic fractions

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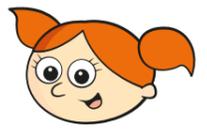
1 Work out the calculations.

a) $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$ $\frac{1}{29} + \frac{1}{29} = \frac{2}{29}$

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

b)

To double a fraction you just double the numerator.



Do you agree with Alex? yes

Explain your answer.

2 Work out the calculations.

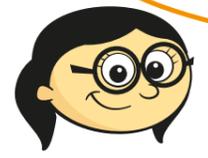
a) $\frac{1}{5} + \frac{1}{5} = \frac{2}{5}$ b) $\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$

$\frac{6}{5} + \frac{6}{5} = \frac{12}{5}$ $\frac{1}{5} + \frac{1}{10} = \frac{3}{10}$

$\frac{29}{5} + \frac{29}{5} = \frac{58}{5}$ $\frac{1}{29} + \frac{1}{58} = \frac{3}{58}$

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

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

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

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

4 Here is an algebraic expression.

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

a) Write the expression as a single fraction.

$\frac{6}{r}$

b) Evaluate the expression when $r = 2$

3

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

e.g. 4

Is there more than one answer?

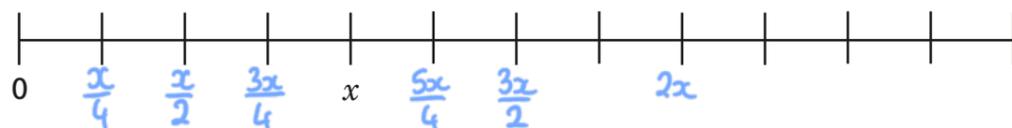
5 Simplify the expressions.

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

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

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) $\frac{x}{4}$

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

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

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

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

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.

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

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

9 Solve the equations. Show all of your working.

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

$x = 4$

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

$y = 8$

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

$z = 6.5$

10 How would you simplify these expressions?

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

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