Planner

Algebraic fractions

- Finding and identifying equivalent algebraic fractions
- Adding and subtracting algebraic fractions

Keywords

You should know

explanation 1a | explanation 1b | online

1 Find three fractions that are equivalent to each of these fractions.

a $\frac{1}{3}$ **b** $\frac{2}{5}$ **c** $\frac{4}{5}$ **d** $\frac{7}{8}$ **e** $\frac{9}{10}$

2 In each group of fractions, find the odd one out.

a $\frac{1}{2}, \frac{9}{16}, \frac{19}{38}, \frac{7}{14}, \frac{56}{112}$ **b** $\frac{3}{5}, \frac{9}{15}, \frac{42}{75}, \frac{21}{35}, \frac{180}{300}$ **c** $\frac{4}{7}, \frac{46}{84}, \frac{36}{63}, \frac{12}{21}, \frac{28}{49}$

3 Find a pair of equivalent fractions in each group.

a $\frac{a}{3}, \frac{4a}{3}, \frac{4a}{12}$ **b** $\frac{x}{8}, \frac{xy}{8}, \frac{3x}{24}$ **c** $\frac{2b}{3}, \frac{6b}{12}, \frac{2b}{4}$ **d** $\frac{ab}{4}, \frac{a+b}{4}, \frac{2(a+b)}{8}$

4 Match each fraction in the left-hand column with its equivalent fraction in the right-hand column.

$\frac{3a}{4}$	$\frac{10(a+1)}{20}$
$\frac{a+1}{2}$	$\frac{2(a+3)}{4}$
$\frac{5a}{8}$	$\frac{15a}{20}$
$\frac{2a+3}{2}$	$\frac{10a}{20}$
$\frac{a}{2}$	$\frac{2(2a+3)}{4}$
$\frac{a+3}{2}$	$\frac{10a}{16}$

explanation 2

5 Simplify these where possible by cancelling common factors.

a $\frac{6y}{3}$ **b** $\frac{4c}{2}$ **c** $\frac{2b}{8}$ **d** $\frac{10f}{25}$

e $\frac{16m^2}{4}$ **f** $\frac{7x^3}{56}$ **g** $\frac{3ab}{12}$ **h** $\frac{24xy}{16}$

6 Simplify these where possible by cancelling common factors.

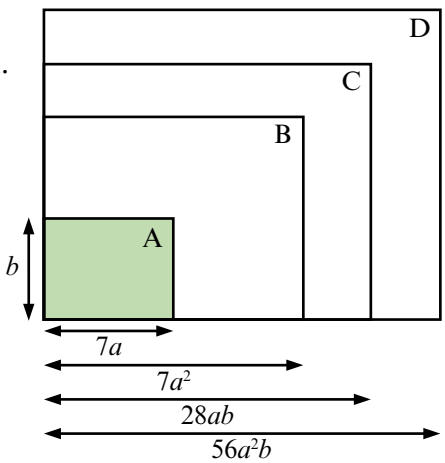
a $\frac{8p}{p}$ **b** $\frac{5x^2}{x}$ **c** $\frac{8ab}{b}$ **d** $\frac{4xy}{x}$

e $\frac{3y}{yz}$ **f** $\frac{5ef}{f}$ **g** $\frac{gh}{g^2}$ **h** $\frac{c}{cd}$

7 Copy and complete the algebraic fractions.

a $\frac{6m}{12} = \frac{\square}{4}$ **b** $\frac{2(3a+1)}{8} = \frac{\square}{4}$ **c** $\frac{20p-16}{20} = \frac{\square}{5}$ **d** $\frac{9x+3y}{18} = \frac{\square}{6}$

8 These rectangles are in proportion.
The length and width of rectangle A are shown.
Using the information given in the diagram, find the width of all the other rectangles.



explanation 3a explanation 3b online

9 Add each pair of fractions.

a $\frac{3}{8} + \frac{8}{9}$ **b** $\frac{4}{7} + \frac{3}{11}$ **c** $\frac{5}{6} + \frac{2}{9}$ **d** $\frac{2}{5} + \frac{7}{8}$

10 Work out these subtractions.

a $\frac{4}{7} - \frac{2}{9}$ **b** $\frac{7}{8} - \frac{5}{6}$ **c** $\frac{11}{12} - \frac{2}{3}$ **d** $\frac{7}{10} - \frac{3}{7}$

11 Copy these and fill in the gaps.

a $\frac{a}{2} + \frac{a}{3} = \frac{3a}{6} + \frac{\square}{6} = \frac{\square}{6}$

b $\frac{y}{4} + \frac{2y}{8} = \frac{\square}{8} + \frac{\square}{8} = \frac{\square}{8} = \frac{\square}{\square}$

c $\frac{2c}{5} + \frac{3d}{4} = \frac{\square}{20} + \frac{\square}{20} = \frac{\square}{20}$

d $\frac{5t}{3} + \frac{2t}{4} = \frac{\square}{12} + \frac{\square}{12} = \frac{\square}{12}$

12 Add these fractions together.
[Hint: First find the lowest common multiple of the denominators.]

a $\frac{b}{2} + \frac{b}{4}$ **b** $\frac{d}{5} + \frac{d}{5}$ **c** $\frac{x}{3} + \frac{x}{6}$

d $\frac{2m}{5} + \frac{m}{2}$ **e** $\frac{5s}{4} + \frac{3t}{3}$ **f** $\frac{4x}{7} + \frac{3y}{14}$

g $\frac{5r}{4} + \frac{4s}{5}$ **h** $\frac{x+1}{2} + \frac{3y}{4}$ **i** $\frac{2a+1}{5} + \frac{a}{3}$

j $\frac{x-2}{10} + \frac{3x}{5}$ **k** $\frac{x-y}{4} + \frac{x+y}{3}$ **l** $\frac{n+2m}{12} + \frac{n+3m}{4}$

m $\frac{a^2}{3} + \frac{3a^2}{4}$ **n** $\frac{3b^2}{5} + \frac{b^2}{4}$ **o** $\frac{3n^2}{7} + \frac{4n^2}{3}$

p $\frac{5a^2}{6} + \frac{3a^2}{4}$ **q** $\frac{p^2+2}{5} + \frac{p^2}{3}$ **r** $\frac{x^2-1}{3} + \frac{2x^2}{4}$

13 Try to spot the errors in these students' calculations.
Write out each calculation correctly.

a $\frac{q}{9} + \frac{3q}{5} = \frac{4q}{14}$

b $\frac{r}{3} + \frac{r}{4} = \frac{2r}{4}$

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

***14** Work out these subtractions.

a $\frac{g}{3} - \frac{g}{5}$ **b** $\frac{h}{2} - \frac{h}{4}$ **c** $\frac{3x}{2} - \frac{3x}{5}$

d $\frac{5m}{2} - \frac{3m}{8}$ **e** $\frac{5y}{3} - \frac{3y}{4}$ **f** $\frac{3b+2}{5} - \frac{3b}{10}$

15 For each of the answers below, write a possible question using addition or subtraction of algebraic fractions.

a $\frac{a}{5}$ **b** $\frac{3b}{2}$ **c** $\frac{a^2}{4}$