

Use fractions in algebraic contexts

1 Work out the missing numbers.

a) $\frac{3}{8} + \frac{1}{4} = \frac{5}{8}$

c) $3 + \frac{3}{4} = 3\frac{3}{4}$

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

d) $5 - \frac{1}{6} = 4\frac{5}{6}$

2 Solve the equations.

a) $x + 3 = 5$

$x = 2$

c) $x - 3 = 5\frac{1}{3}$

$x = 8\frac{1}{3}$

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

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

d) $6\frac{1}{3} = x - 3$

$x = 9\frac{1}{3}$

3 If $s = 2$, work out the value of these expressions.

Give your answers as mixed numbers.

a) $\frac{1}{s} + \frac{3}{s^2} = 1\frac{1}{4}$

b) $\frac{7}{s^2} - \frac{2}{s} = \frac{3}{4}$

c) $\frac{1}{s} + \frac{1}{s} + \frac{2}{s} + 5\frac{1}{7} = 7\frac{1}{7}$

4 Substitute the values $g = 4$ and $h = 3$ into the expressions.
Give your answers as improper fractions.

a) $g + \frac{1}{g} = \frac{17}{4}$

$h + \frac{1}{h} = \frac{10}{3}$

What do you notice about the answers?

b) $1 + \frac{g}{h} = \frac{7}{3}$

$1 + \frac{h}{g} = \frac{7}{4}$

Which answer was greater? Will this be true for any values of g and h ?

c) $g - \frac{g}{h} = \frac{8}{3}$

$h - \frac{h}{g} = \frac{9}{4}$

No values of g and h will ever give a negative answer.



Do you agree with Dexter? No

Talk about it with a partner.

5 Here is the start of the sequence $\frac{n}{3}$

$$\frac{1}{3}, \frac{2}{3}, \frac{3}{3}, \frac{4}{3}$$

a) Write the next four terms of the sequence.

$$\frac{5}{3}, \frac{6}{3}, \frac{7}{3}, \frac{8}{3}$$

b) How many of the terms in part a) are whole numbers?

1

c) Which term will produce $5\frac{2}{3}$?

17th

d) How many terms out of the first 100 terms will be integers?

33

e) How often will the sequence $\frac{2n}{3}$ produce integers?
Show your working.

Every third term.

f) How often will the sequence $\frac{3n}{n}$ produce integers?
Show your working.

Every term.

6 Solve the equations.

a) $x + \frac{2}{3} - \frac{5}{6} = 0$

$$-\frac{2}{3} + \frac{5}{6} \quad -\frac{2}{3} + \frac{5}{6}$$

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

$$= -\frac{4}{6} + \frac{5}{6}$$

$$x = \frac{1}{6}$$

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

$$-\frac{1}{5} \quad -\frac{1}{5}$$

$$x = \frac{5}{2} - \frac{1}{5}$$

$$= \frac{25}{10} - \frac{2}{10} = \frac{23}{10}$$

$$x = 2\frac{3}{10}$$

c) $\frac{16}{7} - \frac{12}{56} = x + 2\frac{1}{2}$

$$\frac{32}{14} - \frac{3}{14} = x + 2\frac{1}{2}$$

$$\frac{29}{14} = x + 2\frac{1}{2}$$

$$2\frac{1}{14} = x + 2\frac{1}{2}$$

$$-2\frac{1}{2} \quad -2\frac{1}{2}$$

$$x = -\frac{1}{7}$$

d) $\frac{300}{7} + x - \frac{1}{3} = \frac{586}{14} + \frac{4}{6}$

$$-\frac{300}{7} + \frac{1}{3} \quad -\frac{300}{7} + \frac{1}{3}$$

$$x = \frac{586}{14} - \frac{300}{7} + \frac{4}{6} + \frac{1}{3}$$

$$= \frac{293}{7} - \frac{300}{7} + \frac{2}{3} + \frac{1}{3}$$

$$= \frac{-7}{7} + 1$$

$$x = 0$$