

Add and subtract improper fractions and mixed numbers

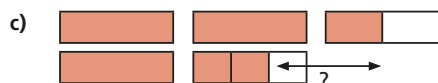
1 Use the bar models to help you work out the calculations.



$$2\frac{1}{2} + 1\frac{1}{3} = 3\frac{5}{6}$$



$$2\frac{1}{2} + 1\frac{2}{3} = 4\frac{1}{6}$$

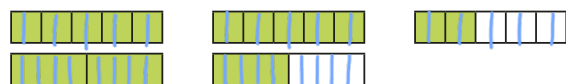


$$2\frac{1}{2} - 1\frac{2}{3} = \frac{5}{6}$$

d) Discuss your method with a partner.
Did you answer the question in the same way?

2 a) Work out $2\frac{2}{5} + 1\frac{1}{2}$ by converting each number to an improper fraction.

Use the diagrams to help you.



$$3\frac{9}{10}$$

b) Work out $2\frac{2}{5} + 1\frac{1}{2}$ by first adding the wholes and then adding the fractions.

Use the diagrams to help you.



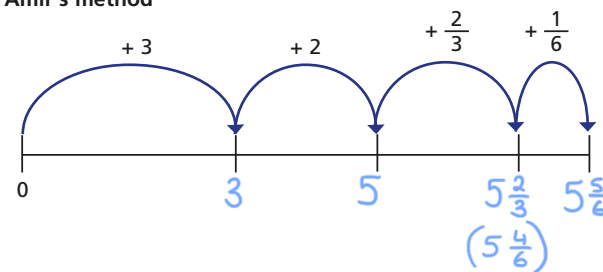
$$3\frac{9}{10}$$

c) Which method did you prefer?

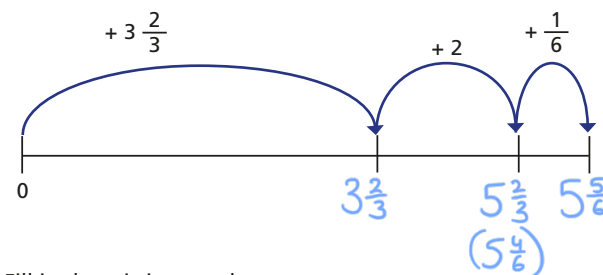


3 Amir and Eva are using a number line to work out $3\frac{2}{3} + 2\frac{1}{6}$

Amir's method



Eva's method



Fill in the missing numbers.

Whose method did you find easier? Various

Talk about it with a partner.

4 Use the fact that $\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$ to work out the additions.

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

d) $17\frac{1}{2} + 11\frac{1}{4} = 28\frac{3}{4}$

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

e) $2\frac{1}{2} + 3\frac{1}{4} + 2 = 7\frac{3}{4}$

c) $5\frac{1}{2} + 2\frac{1}{4} = 7\frac{3}{4}$

f) $7\frac{1}{4} + 3\frac{1}{2} = 10\frac{3}{4}$

- 5 Work out the calculations.

a) $1\frac{3}{5} + 2\frac{1}{4} = \boxed{3\frac{17}{20}}$

$$1+2=3$$

$$\frac{3}{5} + \frac{1}{4} = \frac{12}{20} + \frac{5}{20} = \frac{17}{20}$$

c) $2\frac{1}{5} + \frac{7}{8} = \boxed{3\frac{3}{40}}$

$$2+0=2$$

$$\frac{1}{5} + \frac{7}{8} = \frac{8}{40} + \frac{35}{40} = \frac{43}{40} = 1\frac{3}{40}$$

b) $2\frac{3}{4} - 2\frac{1}{6} = \boxed{\frac{7}{12}}$

$$2-2=0$$

$$\frac{3}{4} - \frac{1}{6} = \frac{9}{12} - \frac{2}{12} = \frac{7}{12}$$

d) $3\frac{3}{8} - 2\frac{7}{10} = \boxed{\frac{27}{40}}$

$$3-2=1$$

$$\frac{3}{8} - \frac{7}{10} = \frac{15}{40} - \frac{28}{40} = -\frac{13}{40}$$

- 6 Esther needs to cycle 18 km in three days.

The table shows how far she cycles on Monday and Tuesday.

How far does she need to cycle on Wednesday to meet her target?

Day	Distance cycled (km)
Monday	$4\frac{1}{5}$
Tuesday	$7\frac{2}{3}$

$$4\frac{1}{5} + 7\frac{2}{3} = 11\frac{13}{15}$$

$$4+7=11$$

$$\frac{1}{5} + \frac{2}{3} = \frac{3}{15} + \frac{10}{15} = \frac{13}{15}$$

$$18 - 11\frac{13}{15} = 6\frac{2}{15}$$

$\boxed{6\frac{2}{15}}$ km

- 7 Work out the additions.

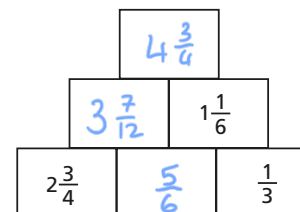
a) $\frac{11}{3} + 1\frac{3}{4} = \boxed{5\frac{5}{12}}$

b) $2\frac{1}{6} + \frac{15}{9} = \boxed{3\frac{5}{6}}$

- 8 In the fraction pyramid, the number in each box is the sum of the two numbers below.

Is the number in the top box greater than 5.25? No

Show your working.



$$1\frac{1}{6} - \frac{1}{3} = 1\frac{1}{6} - \frac{2}{6} = \frac{5}{6}$$

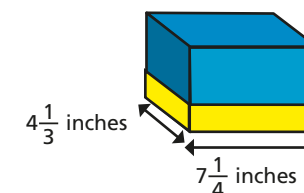
$$2\frac{3}{4} + \frac{5}{6} = 2\frac{9}{12} + \frac{10}{12} = 2\frac{19}{12} = 3\frac{7}{12}$$

$$3\frac{7}{12} + 1\frac{1}{6} = 3\frac{7}{12} + 1\frac{2}{12} = 4\frac{9}{12} = 4\frac{3}{4}$$

- 9 The diagram shows a cake box.

A 25-inch ribbon is used to wrap around the base of the cake box.

How much of the ribbon will be left over?



$$4\frac{1}{3} + 7\frac{1}{4} + 4\frac{1}{3} + 7\frac{1}{4}$$

$$= 22 + \frac{4}{12} + \frac{3}{12} + \frac{4}{12} + \frac{3}{12}$$

$$= 22\frac{14}{12}$$

$$= 23\frac{7}{6}$$

$$= 23\frac{1}{6}$$

$$25 - 23\frac{1}{6} = 1\frac{5}{6}$$

$\boxed{1\frac{5}{6}}$ inches