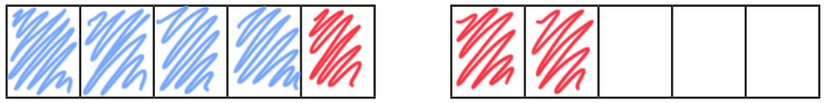
Add and subtract fractions

1 Complete the calculations.

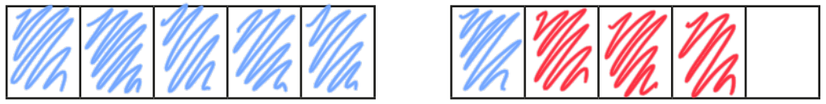
Use the bar models to help you.

a)



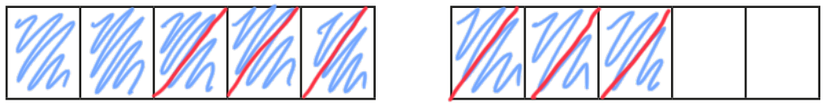
$\frac{4}{5} + \frac{3}{5} = \boxed{\frac{7}{5}} = \boxed{1\frac{2}{5}}$

b)



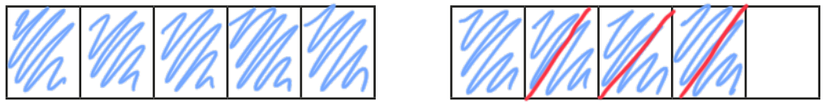
$\frac{6}{5} + \frac{3}{5} = \boxed{\frac{9}{5}} = \boxed{1\frac{4}{5}}$

c)



$\frac{8}{5} - \frac{6}{5} = \boxed{\frac{2}{5}}$

d)



$\frac{9}{5} - \frac{3}{5} = \boxed{\frac{6}{5}} = \boxed{1\frac{1}{5}}$

2 Complete the calculations.

a) $\frac{4}{7} + \frac{2}{7} = \boxed{\frac{6}{7}}$

b) $\frac{4}{7} + \frac{3}{7} = \boxed{\frac{7}{7}} = \boxed{1}$

c) $\frac{4}{7} + \frac{4}{7} = \boxed{\frac{8}{7}} = \boxed{1\frac{1}{7}}$

d) $\frac{8}{7} - \frac{3}{7} = \boxed{\frac{5}{7}}$

e) $\frac{7}{9} + \frac{8}{9} = \boxed{\frac{15}{9}} = \boxed{1\frac{2}{3}}$

f) $\frac{17}{9} - \frac{8}{9} = \boxed{\frac{9}{9}} = \boxed{1}$

g) $\frac{16}{9} - \frac{8}{9} = \boxed{\frac{8}{9}}$

h) $\frac{7}{9} + \frac{2}{9} + \frac{8}{9} = \boxed{\frac{17}{9}} = \boxed{1\frac{8}{9}}$

i) $\frac{7}{15} + \frac{2}{15} + \frac{8}{15} = \boxed{\frac{17}{15}} = \boxed{1\frac{2}{5}}$

j) $\frac{7}{15} - \frac{2}{15} + \frac{8}{15} = \boxed{\frac{13}{15}}$

3

$\frac{\square}{8} + \frac{\square}{8} = \frac{13}{8}$

What could the missing numerators be?

Give six different possibilities.

e.g.

$\frac{\boxed{1}}{8} + \frac{\boxed{12}}{8} = \frac{13}{8}$

$\frac{\boxed{2}}{8} + \frac{\boxed{11}}{8} = \frac{13}{8}$

$\frac{\boxed{3}}{8} + \frac{\boxed{10}}{8} = \frac{13}{8}$

$\frac{\boxed{4}}{8} + \frac{\boxed{9}}{8} = \frac{13}{8}$

$\frac{\boxed{5}}{8} + \frac{\boxed{8}}{8} = \frac{13}{8}$

$\frac{\boxed{7}}{8} + \frac{\boxed{6}}{8} = \frac{13}{8}$

4 Dora has $2\frac{3}{8}$ litres of juice.

She pours out $\frac{9}{8}$ litres of juice.

How many litres of juice does she have left?

Dora has $\boxed{1\frac{1}{4}}$ litres left.

5 Fill in the missing numerators.

a) $\frac{3}{8} + \frac{\boxed{10}}{8} = \frac{13}{8}$

b) $\frac{13}{8} - \frac{\boxed{6}}{8} = \frac{7}{8}$

c) $\frac{13}{8} - \frac{\boxed{5}}{8} = 1$

d) $\frac{11}{9} + \frac{\boxed{11}}{9} = \frac{22}{9} = 2\frac{\boxed{4}}{9}$

e) $\frac{11}{9} + \frac{\boxed{9}}{9} = \frac{\boxed{20}}{9} = 2\frac{2}{9}$

f) $\frac{22}{9} - \frac{\boxed{2}}{9} = \frac{\boxed{20}}{9} = 2\frac{2}{9}$

g) $\frac{4}{7} + \frac{\boxed{6}}{7} + \frac{4}{7} = 2$

h) $\frac{5}{7} + \frac{\boxed{4}}{7} + \frac{5}{7} = 2$

i) $\frac{6}{7} + \frac{\boxed{2}}{7} + \frac{6}{7} = 2$

j) $\frac{14}{7} + \frac{\boxed{3}}{7} + \frac{4}{7} = 3$

k) $\frac{15}{7} + \frac{\boxed{1}}{7} + \frac{5}{7} = 3$

i) $\frac{16}{7} + \frac{\boxed{6}}{7} + \frac{6}{7} = 4$

Compare answers with a partner. What do you notice?

6 Here are some fraction cards.

$\frac{9}{8}$ $\frac{13}{8}$ $\frac{1}{8}$ $\frac{7}{8}$ $\frac{3}{8}$ $1\frac{7}{8}$

Use the cards to write pairs of fractions with a total of 2

$\boxed{1\frac{7}{8}} + \boxed{\frac{1}{8}} = 2$

$\boxed{\frac{13}{8}} + \boxed{\frac{3}{8}} = 2$

$\boxed{\frac{9}{8}} + \boxed{\frac{7}{8}} = 2$

7 Annie and Dexter both have a skipping rope.

Annie's rope is $\frac{3}{4}$ m shorter than Dexter's rope.

The ropes are $\frac{13}{4}$ m altogether.

How long is each skipping rope?

Annie's rope is $\boxed{1\frac{1}{4}}$ m long.

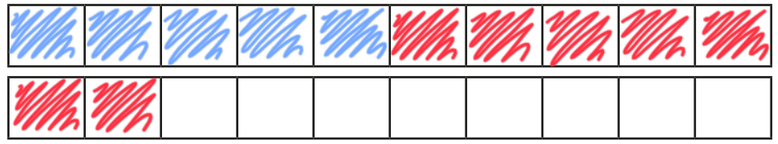
Dexter's rope is $\boxed{2}$ m long.

Add fractions

1 Complete the calculations.

Use the bar models to help you.

a)

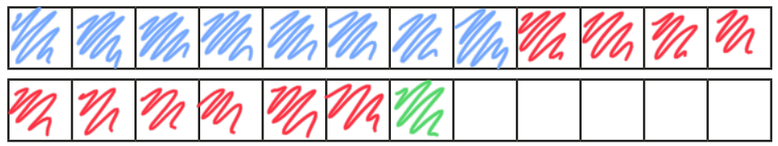


$\frac{1}{2} + \frac{7}{10} = \boxed{\frac{12}{10}} = \boxed{1\frac{1}{5}}$

b)

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

c)



$\frac{2}{3} + \frac{5}{6} + \frac{1}{12} = \boxed{\frac{19}{12}} = \boxed{1\frac{7}{12}}$

2 Complete the additions.

a) $\frac{4}{5} + \frac{7}{20} = \boxed{\frac{23}{20}} = \boxed{1\frac{3}{20}}$

b) $\frac{5}{4} + \frac{7}{20} = \boxed{\frac{32}{20}} = \boxed{1\frac{3}{5}}$

c) $\frac{3}{4} + \frac{5}{12} = \boxed{\frac{14}{12}} = \boxed{1\frac{1}{6}}$

d) $\frac{4}{3} + \frac{5}{12} = \boxed{\frac{21}{12}} = \boxed{1\frac{3}{4}}$

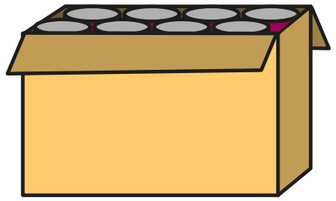
e) $\frac{3}{5} + \frac{11}{15} = \boxed{\frac{20}{15}} = \boxed{1\frac{1}{3}}$

f) $\frac{5}{3} + \frac{11}{15} = \boxed{\frac{36}{15}} = \boxed{2\frac{2}{5}}$

3 Match the additions that have the same answer.

$\frac{3}{5} + \frac{9}{20}$	$\frac{16}{20} + \frac{9}{20}$
$\frac{3}{4} + \frac{9}{20}$	$\frac{12}{20} + \frac{9}{20}$
$\frac{4}{5} + \frac{9}{20}$	$\frac{14}{20} + \frac{9}{20}$
$\frac{7}{10} + \frac{9}{20}$	$\frac{15}{20} + \frac{9}{20}$

4 Dexter has some tins of food. There are four types of food: beans, sweetcorn, soup and tomatoes.



- The total weight of all the tins is 2 kg.
- The tins of beans weigh $\frac{2}{3}$ kg.
- The tins of sweetcorn weigh $\frac{5}{12}$ kg.
- The tins of soup weigh $\frac{1}{4}$ kg.

a) Work out the total weight of the tins of beans, sweetcorn and soup.

$1\frac{1}{3}$ kg

b) How much do the tins of tomatoes weigh?

$\frac{2}{3}$ kg

5 Complete the addition pyramids.

a)

	2	
	$\frac{7}{6}$	$\frac{5}{6}$
$\frac{2}{3}$	$\frac{1}{2}$	$\frac{1}{3}$

b)

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

c)

	$\frac{9}{10}$	
$\frac{2}{5}$		$\frac{1}{2}$
$\frac{1}{5}$	$\frac{1}{5}$	$\frac{3}{10}$

6 What could the three missing numerators be?

$$\frac{\square}{4} + \frac{\square}{12} + \frac{\square}{3} = \frac{13}{12}$$

Give three different possibilities.

$$\frac{1}{4} + \frac{6}{12} + \frac{1}{3} = \frac{13}{12}$$

$$\frac{2}{4} + \frac{3}{12} + \frac{1}{3} = \frac{13}{12}$$

$$\frac{1}{4} + \frac{2}{12} + \frac{2}{3} = \frac{13}{12}$$

Add mixed numbers

1 Teddy and Mo are adding mixed numbers.

Teddy

$3\frac{1}{4} + 2\frac{5}{8} = 5 + \frac{7}{8} = 5\frac{7}{8}$

$3\frac{1}{4} + 2\frac{5}{8} = \frac{26}{8} + \frac{21}{8} = \frac{47}{8} = 5\frac{7}{8}$

Mo

Whose method do you prefer? various

Talk about it with a partner.

2 Complete the calculations.

a) $1\frac{2}{5} + 2\frac{3}{10} =$ $3\frac{7}{10}$

b) $2\frac{2}{5} + 2\frac{3}{10} =$ $4\frac{7}{10}$

c) $1\frac{3}{4} + 3\frac{3}{20} =$ $4\frac{9}{10}$

d) $1\frac{3}{16} + 4\frac{3}{4} =$ $5\frac{15}{16}$

e) $4\frac{1}{4} + 2\frac{11}{16} =$ $6\frac{15}{16}$

f) $1\frac{4}{15} + 3\frac{2}{3} =$ $4\frac{14}{15}$

3

$2\frac{3}{5} + 1\frac{7}{10} = 3 + \frac{13}{10} = 3\frac{13}{10}$

How can Ron improve his answer?

$\frac{13}{10} = 1\frac{3}{10}$ so $3\frac{13}{10} = 4\frac{3}{10}$

4 Complete the additions.

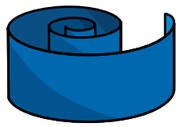
a) $2\frac{3}{4} + 3\frac{5}{12} =$ $6\frac{1}{6}$

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

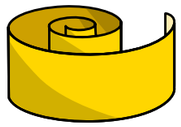
c) $5\frac{1}{6} + 3\frac{11}{12} =$ $9\frac{1}{12}$

d) $6\frac{7}{15} + 3\frac{3}{5} =$ $10\frac{1}{15}$

5 A blue ribbon is $2\frac{4}{9}$ metres long.



A yellow ribbon is $3\frac{2}{3}$ metres long.

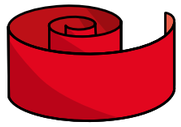


a) What is the total length of the blue and yellow ribbon?

$6\frac{1}{9}$ m

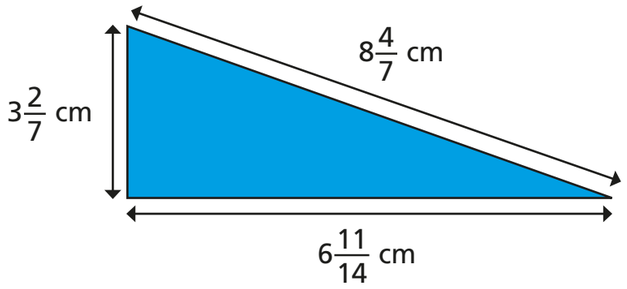
b) A red ribbon is $1\frac{5}{18}$ metres longer than the yellow ribbon.

How long is the red ribbon?



$4\frac{17}{18}$ m

6 Calculate the perimeter of the triangle.



$18\frac{9}{14}$ cm

7 Complete the calculation in three different ways.

e.g.

$1\ \frac{1}{5} + 5\ \frac{8}{15} = 6 + \frac{11}{15} = 6\frac{11}{15}$

$3\ \frac{2}{5} + 3\ \frac{5}{15} = 6 + \frac{11}{15} = 6\frac{11}{15}$

$1\ \frac{4}{5} + 4\ \frac{14}{15} = 6 + \frac{11}{15} = 6\frac{11}{15}$

Compare answers with a partner.

8 Here are some number cards.

$3\frac{1}{6}$	$2\frac{11}{12}$	$2\frac{5}{6}$	$3\frac{5}{6}$	$4\frac{1}{12}$	$4\frac{1}{3}$

a) What is the greatest total you can make with two cards?

$8\frac{5}{12}$

b) What is the smallest total you can make with two cards?

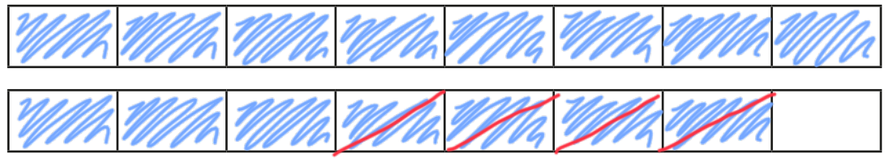
$5\frac{3}{4}$

Subtract mixed numbers

1 Complete the subtractions.

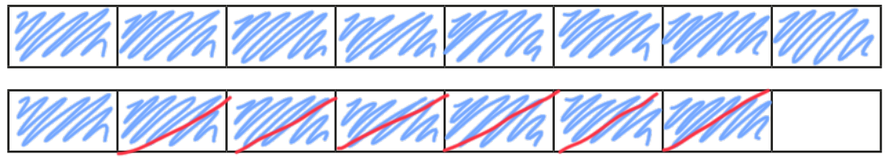
Use the bar models to help you.

a)



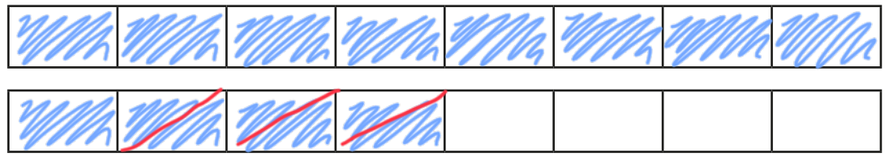
$\frac{15}{8} - \frac{1}{2} =$ $1\frac{3}{8}$

b)



$1\frac{7}{8} - \frac{3}{4} =$ $1\frac{1}{8}$

c)

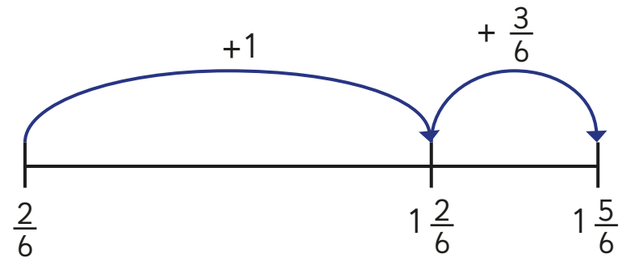


$1\frac{1}{2} - \frac{3}{8} =$ $1\frac{1}{8}$

2 Dexter and Whitney are using number lines to work out $1\frac{5}{6} - \frac{1}{3}$

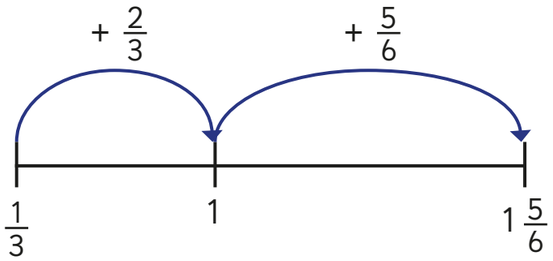
Dexter's method

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



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

Whitney's method



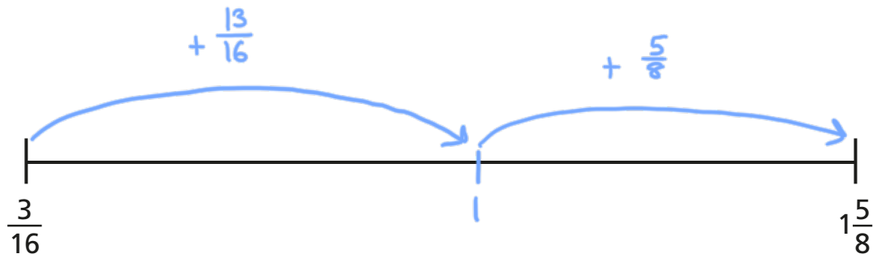
$\frac{2}{3} = \frac{4}{6}$

$\frac{4}{6} + \frac{5}{6} + \frac{9}{6} = 1\frac{1}{2}$

What is the same and what is different about these methods?

Use one of the methods to work out $1\frac{5}{8} - \frac{3}{16}$

e.g



$\frac{13}{16} + \frac{10}{16} = \frac{23}{16} = 1\frac{7}{16}$

$1\frac{5}{8} - \frac{3}{16} =$ $1\frac{7}{16}$

3 Complete the subtractions.

a) $3\frac{1}{4} - \frac{5}{24} =$ $3\frac{1}{24}$

b) $3\frac{3}{16} - \frac{1}{8} =$ $3\frac{1}{16}$

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

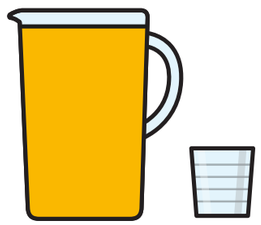
d) $7\frac{5}{6} - \frac{13}{24} =$ $7\frac{7}{24}$

e) $4\frac{4}{9} - \frac{4}{27} =$ $4\frac{8}{27}$

f) $6\frac{11}{12} - \frac{3}{4} =$ $6\frac{1}{6}$

4 A jug contains $1\frac{3}{5}$ litres of orange juice.

Eva pours $\frac{4}{15}$ litres into a glass.



How much orange juice is left in the jug?

There are $1\frac{1}{3}$ litres of orange juice left in the jug.

5 Find three different ways to complete the calculation.

e.g.

$3\frac{1}{5} - \frac{3}{20} = 3\frac{1}{20}$

$3\frac{3}{5} - \frac{11}{20} = 3\frac{1}{20}$

$3\frac{2}{5} - \frac{7}{20} = 3\frac{1}{20}$

Are there any other ways to complete this calculation?

6 Three children take part in throwing competitions.

Here is the table of results.

	Javelin	Shot Put	Discus
Dexter	$15\frac{1}{4}$ m	$7\frac{5}{12}$ m	$12\frac{3}{8}$ m
Amir	$13\frac{3}{8}$ m	$8\frac{1}{4}$ m	$12\frac{7}{8}$ m
Annie	$14\frac{1}{3}$ m	9 m	$11\frac{5}{12}$ m

Use the clues to complete the table.

- Annie's javelin throw is $\frac{11}{12}$ m less than Dexter's.
- Amir's shot put throw is $\frac{3}{4}$ m less than Annie's.
- Dexter's discus throw is $\frac{1}{2}$ m less than Amir's