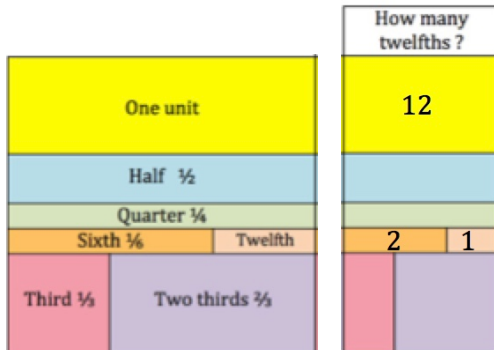


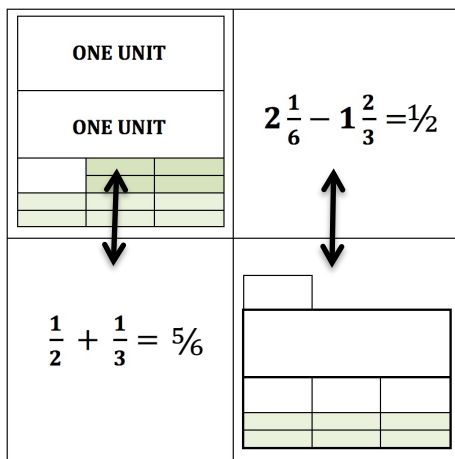
**TWELFTHS**

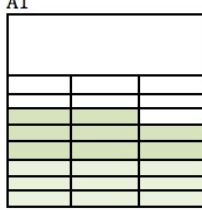
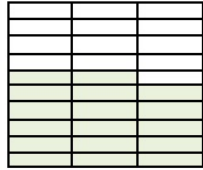
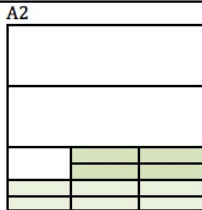
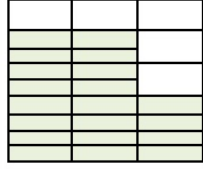
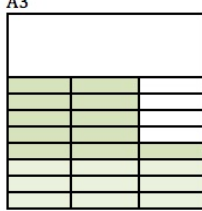
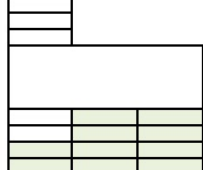
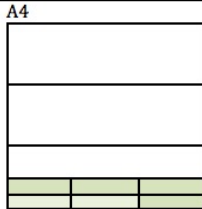
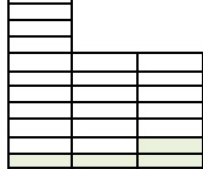
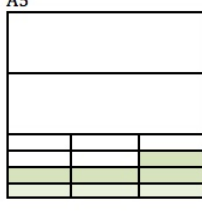

Write the number of twelfths for each fraction to match the colours. Three of the answers are filled in.



The 2 calculations below each match one of the pictures.

Each frame is 3 units.



A1 	B1 $\frac{1}{4} + \frac{1}{3} =$	S1 $2\frac{1}{6} - 1\frac{2}{3} =$	T1 
A2 	B2 $\frac{1}{6} + \frac{1}{3} =$	S2 $2\frac{1}{2} - 1\frac{1}{12} =$	T2 
A3 	B3 $\frac{3}{4} + \frac{11}{12} =$	S3 $2\frac{1}{3} - 1\frac{3}{4} =$	T3 
A4 	B4 $\frac{1}{2} + \frac{1}{3} =$	S4 $2\frac{1}{2} - \frac{5}{6} =$	T4 
A5 	B5 $\frac{3}{4} + \frac{2}{3} =$	S5 $2\frac{1}{3} - 1\frac{1}{2} =$	T5 

Now for the big challenge.

Cut out these 20 cards Can you sort them into 5 sets matching each A card with a B an S and a T card?

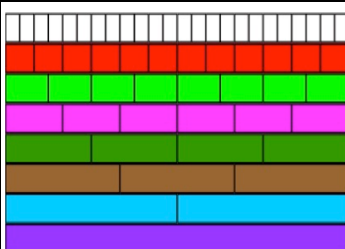
**Help**

Look at the picture cards (A and T sets) and match them in pairs.

What fraction of each card shows in green?

Now look at the B and S sets of cards. They give the answers to the calculations.

Now arrange the cards into 5 sets of 4 cards with one of each of the A, T, B and S cards in each set.



**Extension**

Write down all the fractions you can see in the diagram equivalent to:  
a. three quarters, b. five sixths, c. six sixteenths d. seven twelfth, e. six twentyfourths

Explain the rules for deciding when one fraction is equivalent to another.

See: Fraction Wall <https://aiminghigh.aimssec.ac.za/grades-4-to-6-fraction-wall/>

# NOTES FOR TEACHERS

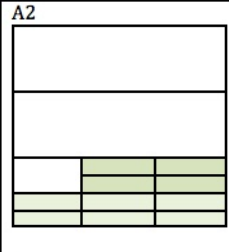
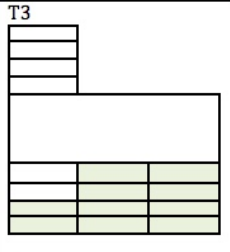
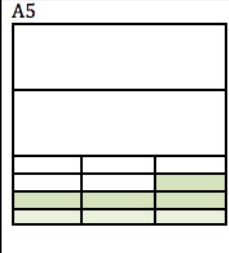
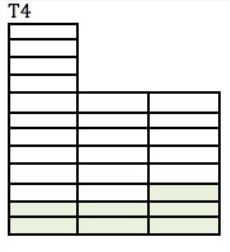
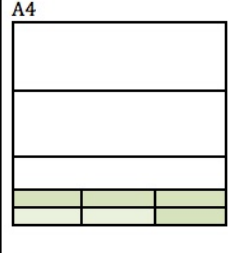
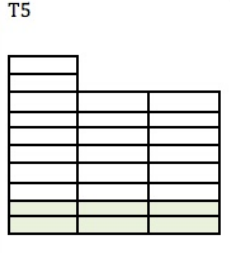

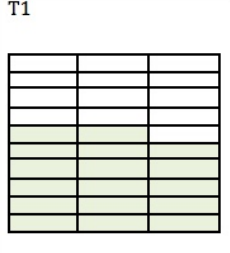

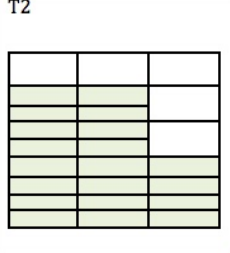
## SOLUTION

These are the solution sets:

**A2, B4, S5, T3**  
**A5, B1, S3, T4**  
**A4, B2, S1, T5**  
**A3, B5, S2, T1**  
**A1, B3, S4, T2**

In the A cards each shade of green matches one of the fractions that you add together.

The T cards show the first fraction and the unshaded part matches the fraction subtracted. So the green region gives the answer to the calculation.

<p>A2</p> 	<p>B4</p> $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$	<p>S5</p> $2\frac{1}{3} - 1\frac{1}{2} = \frac{5}{6}$	<p>T3</p> 
<p>A5</p> 	<p>B1</p> $\frac{1}{4} + \frac{1}{3} = \frac{7}{12}$	<p>S3</p> $2\frac{1}{3} - 1\frac{3}{4} = \frac{7}{12}$	<p>T4</p> 
<p>A4</p> 	<p>B2</p> $\frac{1}{6} + \frac{1}{3} = \frac{1}{2}$	<p>S1</p> $2\frac{1}{6} - 1\frac{2}{3} = \frac{1}{2}$	<p>T5</p> 
<p>A3</p> 	<p>B5</p> $\frac{3}{4} + \frac{2}{3} = 1\frac{5}{12}$	<p>S2</p> $2\frac{1}{2} - 1\frac{1}{12} = 1\frac{5}{12}$	<p>T1</p> 
<p>A1</p> 	<p>B3</p> $\frac{3}{4} + \frac{11}{12} = 1\frac{2}{3}$	<p>S4</p> $2\frac{1}{2} - \frac{5}{6} = 1\frac{2}{3}$	<p>T2</p> 

**Diagnostic Assessment** This should take about 5–10 minutes.

- Write the question on the board, say to the class:  
**“Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D”.**
- Notice how the learners responded. Ask a learner who gave answer A to explain why he or she gave that answer and **DO NOT** say whether it is right or wrong but simply thank the learner for giving the answer.
- Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.
- Ask the class again to vote for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.** It is important for learners to explain the reason for their answer otherwise many learners will just make a guess.
- If the concept is needed for the lesson to follow, explain the right answer or give a remedial task.

## Fractions

Which fraction is the greatest?



A	B	C	D
$\frac{3}{4}$	$\frac{2}{3}$	$\frac{7}{12}$	$\frac{1}{2}$

The correct answer is **A** as  $\frac{3}{4} = \frac{9}{12}$

Equivalent fractions written as twelfths show that A gives the greatest fraction.

**B**  $\frac{2}{3} = \frac{8}{12}$

**C**  $\frac{7}{12}$

**B**  $\frac{1}{2} = \frac{6}{12}$

<https://diagnosticquestions.com>

## Why do this activity?

This activity helps learners to visualize equivalent fractions and gives them practice in addition and subtraction of fractions and mixed numbers.

## Intended learning outcomes

- Practice in recognizing equivalent fractions.
- Practice in addition and subtraction of common fractions in which one denominator is a multiple of another.
- Addition and subtraction of mixed numbers

## Suggestions for teaching

*Resources: A copy of the worksheet on page 1 for each group of learners or write this on the board. A set of cards for each group of learners. Choose the **less challenging set (page 6)** or the **more challenging set (page 5)** to suit your learners. One set of **large cards (pages 7 to 11)** for whole class activity. Prestik or similar to stick cards on the wall or board.*

Start with the Diagnostic Quiz as a warm up and to review the learners' understanding of equivalent fractions and twelfths.

One unit		

You could draw this diagram on the board and ask learners to tell you:

“How many twelfths make one unit?”

“How many twelfths make a half?”

“How many twelfths make a quarter?”

“How many twelfths make a sixth?”

“How many twelfths make a third?”

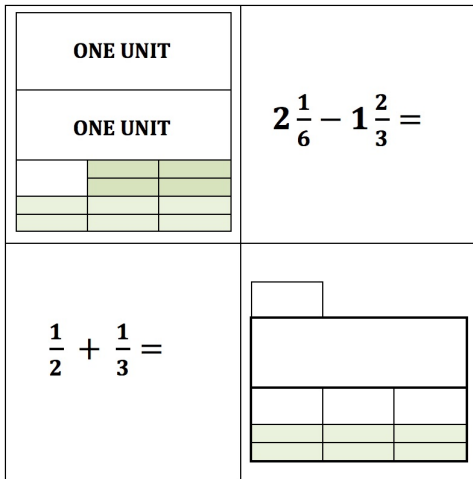
“How many twelfths make two thirds?”

One unit		How many twelfths ?
		12
Half $\frac{1}{2}$		
Quarter $\frac{1}{4}$		
Sixth $\frac{1}{6}$	Twelfth	2   1
Third $\frac{1}{3}$	Two thirds $\frac{2}{3}$	

If possible arrange for the learners to work in groups of four and give one worksheet (*page 1*) to each group.

Ask the learners to start by writing the number of twelfths for each fraction to match the colours.

Then check that the learners can do this correctly.



Ask the learners to complete these two calculations and match each calculation to one of the pictures.

Then check that the learners can do this correctly.

Then give one set of cards to each group and ask them to sort the 20 cards into 5 sets with 4 cards in each set by matching each A card with a B card, an S card and a T card?

There is a *less challenging (page 6) set of cards* that gives the answers to the fraction calculations and a more challenging set that does not give the answers. The first time the learners do this they could be given the less challenging set and then they could do it again another time using the *more challenging set (page 5)*.

If any of the groups have difficulty in getting started you could suggest that they match pairs of pictures on the A and T cards first.

- A1, B3, S4, T2
- A2, B4, S5, T3
- A3, B5, S2, T1
- A4, B2, S1, T5
- A5, B1, S3, T4

Prepare a space on the board or on the wall to fix 4 columns of the *big cards (pages 7 to 11)*.

Stick the A cards up in a column to start the display.

To end the lesson the learners will come and put the other big cards in the correct places on the display.

Hold up the B cards in turn and ask “Who can come and put this in the right place?”

Next hold up the S cards in turn and ask “Who can come and put this in the right place?”

Finally hold up the T cards in turn and ask “Who can come and put this in the right place?”

If anyone puts a card in the wrong place then you can ask the class “Is that right?” As all the learners have worked on the card sorting task some of the groups will have found the right match for that card.

Finally summarise what the learners have learned from the lesson.

## Key questions

- How many twelfths is that?
- Can you find two pictures that show the same fraction?
- Can you find another two pictures that show the same fraction?
- What fraction does that picture show you? Is it a mixed number?
- Could you show me how that fraction is shaded in the diagram?
- Can you explain to me which part of the diagram shows that fraction?

## Follow up ideas

**Fraction Wall** <https://aiminghigh.aimssec.ac.za/years-4-6-fraction-wall/>

**Fractions by Halves** <https://aiminghigh.aimssec.ac.za/years-5-6-fractions-by-halves/>

**Fractions by Thirds** <https://aiminghigh.aimssec.ac.za/years-4-7-fractions-by-thirds/>

**Chocolate** <https://aiminghigh.aimssec.ac.za/years-4-to-7-chocolate/>

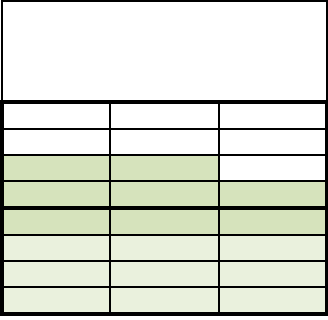
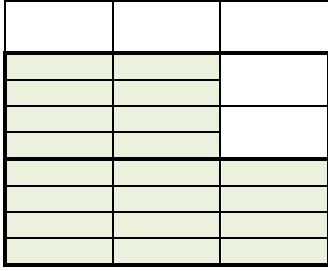
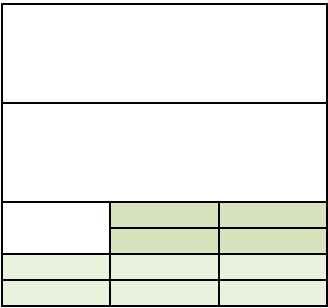
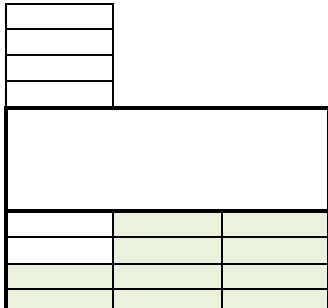
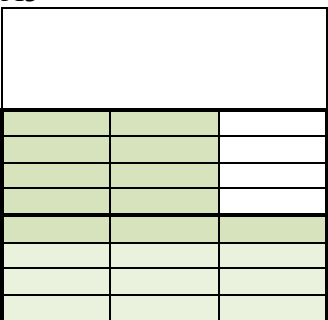
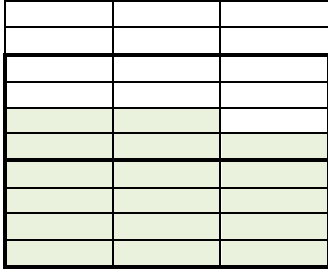
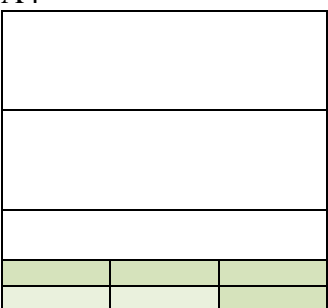
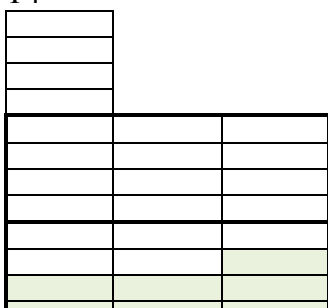
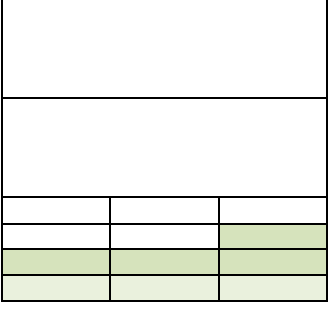
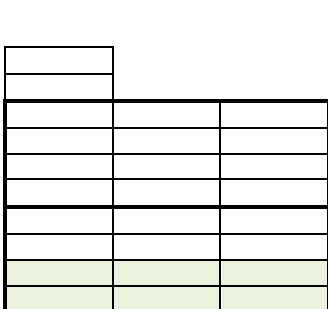
**Note:** The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA, to Years 4 to 12 in the UK and up to Secondary 5 in East Africa. New material will be added for Secondary 6.

For resources for teaching A level mathematics see <https://nrich.maths.org/12339>

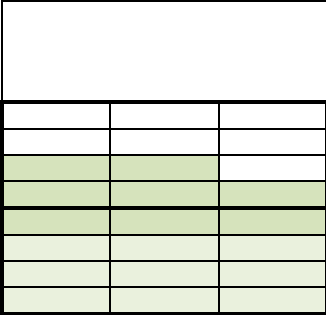
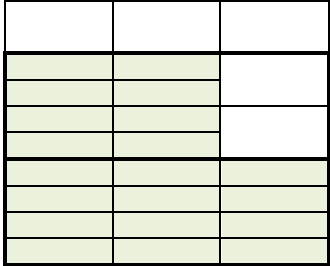
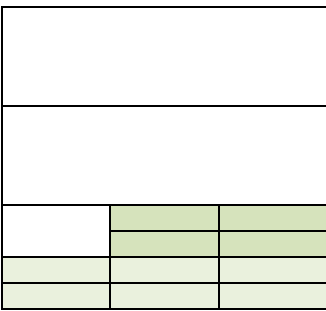
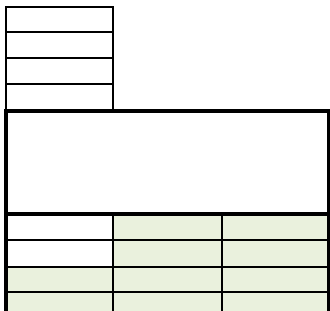
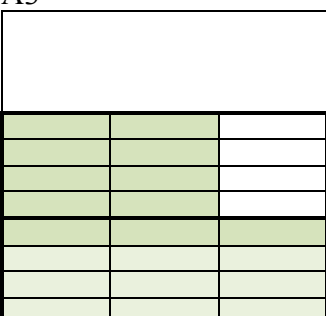
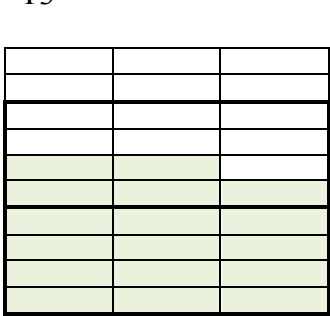
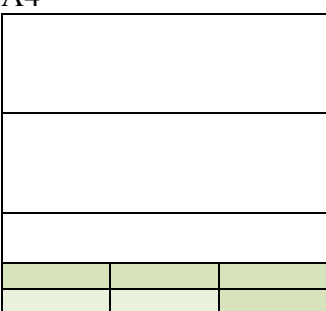
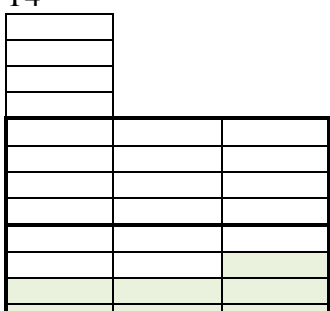
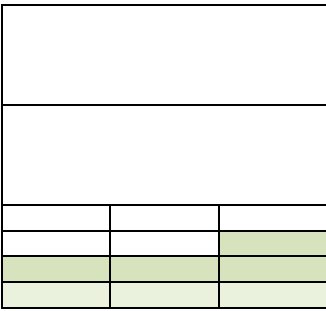
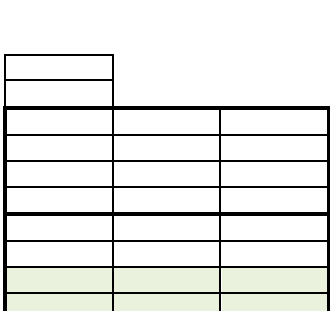
**Note:** The mathematics taught in Year 13 (UK) and Secondary 6 (East Africa) is **beyond** the school curriculum for Grade 12 SA.

	Lower Primary or Foundation Phase Age 5 to 9	Upper Primary Age 9 to 11	Lower Secondary Age 11 to 14	Upper Secondary Age 15+
South Africa	Grades R and 1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
USA	Kindergarten and G1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
UK	Reception and Years 1 to 3	Years 4 to 6	Years 7 to 9	Years 10 to 13
East Africa	Nursery and Primary 1 to 3	Primary 4 to 6	Secondary 1 to 3	Secondary 4 to 6

More challenging set of cards – the learners have to complete the calculations.

<p>A1</p> 	<p>B1</p> $\frac{1}{6} + \frac{1}{3} =$	<p>S1</p> $2\frac{1}{6} - 1\frac{2}{3} =$	<p>T1</p> 
<p>A2</p> 	<p>B2</p> $\frac{3}{4} + \frac{2}{3} =$	<p>S2</p> $2\frac{1}{2} - 1\frac{1}{12} =$	<p>T2</p> 
<p>A3</p> 	<p>B3</p> $\frac{3}{4} + \frac{11}{12} =$	<p>S3</p> $2\frac{1}{3} - 1\frac{3}{4} =$	<p>T3</p> 
<p>A4</p> 	<p>B4</p> $\frac{1}{2} + \frac{1}{3} =$	<p>S4</p> $2\frac{1}{2} - \frac{5}{6} =$	<p>T4</p> 
<p>A5</p> 	<p>B5</p> $\frac{1}{4} + \frac{1}{3} =$	<p>S5</p> $2\frac{1}{3} - 1\frac{1}{2} =$	<p>T5</p> 

Less challenging set of cards – the answer to the calculations are given.

<p>A1</p> 	<p>B1</p> $\frac{1}{6} + \frac{1}{3} = \frac{1}{2}$	<p>S1</p> $2\frac{1}{6} - 1\frac{2}{3} = \frac{1}{2}$	<p>T1</p> 
<p>A2</p> 	<p>B2</p> $\frac{3}{4} + \frac{2}{3} = 1\frac{5}{12}$	<p>S2</p> $2\frac{1}{2} - 1\frac{1}{12} = 1\frac{5}{12}$	<p>T2</p> 
<p>A3</p> 	<p>B3</p> $\frac{3}{4} + \frac{11}{12} = 1\frac{2}{3}$	<p>S3</p> $2\frac{1}{3} - 1\frac{3}{4} = \frac{7}{12}$	<p>T3</p> 
<p>A4</p> 	<p>B4</p> $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$	<p>S4</p> $2\frac{1}{2} - \frac{5}{6} = 1\frac{2}{3}$	<p>T4</p> 
<p>A5</p> 	<p>B5</p> $\frac{1}{4} + \frac{1}{3} = \frac{7}{12}$	<p>S5</p> $2\frac{1}{3} - 1\frac{1}{2} = \frac{5}{6}$	<p>T5</p> 

# A1


# B1

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

# T1


# S1

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

# A2


# B2

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

# T2


# S2

$$2\frac{1}{2} - 1\frac{1}{12} = 1\frac{5}{12}$$



# A3


# B3

$$\frac{3}{4} + \frac{11}{12} = 1\frac{2}{3}$$

# T3


# S3

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

# A4


# B4

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

# T4


# S4

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

# A5


# B5

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

# T5


# S5

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