

Have a go at these arithmetic calculations.

1. $2^3 + 4 =$

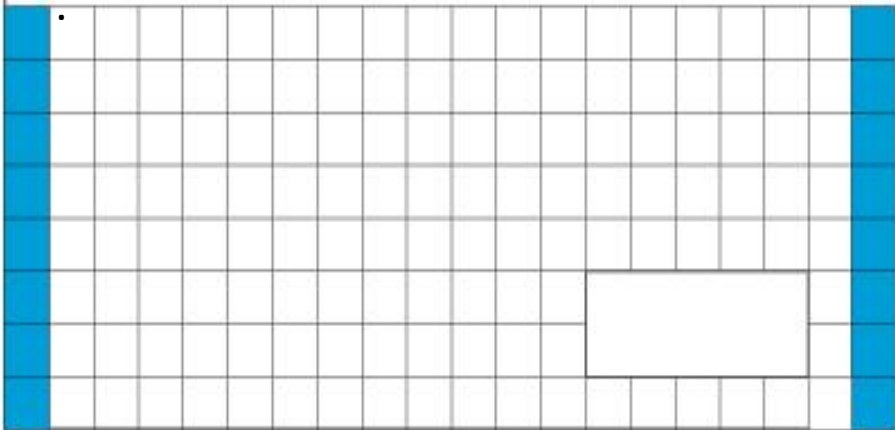
2. $15 - 8.1 =$

3. $21.64 \times 4 =$

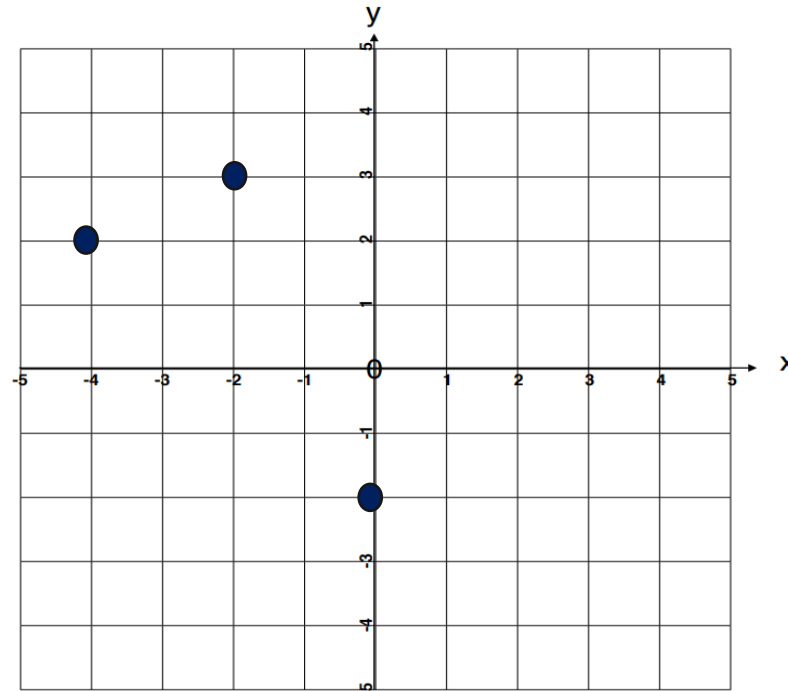
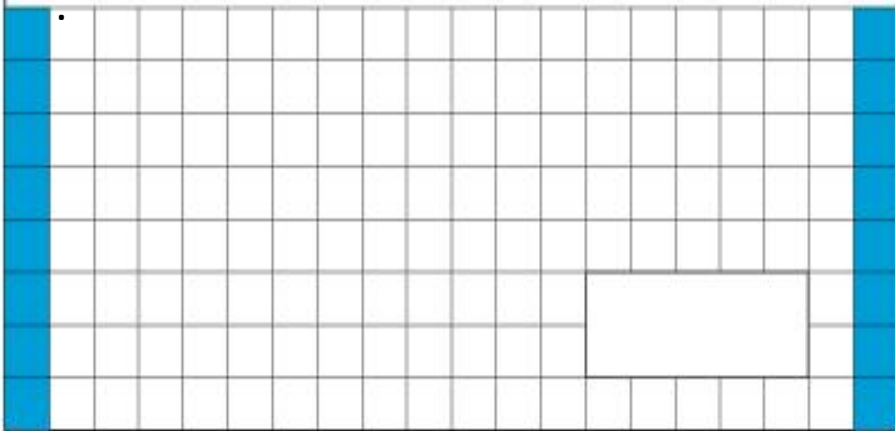
4. 25% of 4200 =

Complete as many of these as you can in 3 minutes:

1 $50.27 \div 10 =$



2 _____ = $604,293 - 56,107$



Here is a coordinate grid with three vertices of a rectangle drawn on it. What are the **coordinates** of the fourth vertex?



Lesson 27

Learning Question:

Can I add, subtract, multiply or divide fractions and mixed numbers?

Success Criteria:

- Understand and use the strategy for solving calculations with fractions for all four operations.

Vocabulary

Fraction
Denominator
Numerator
Mixed number
Improper
Calculate
Add
Subtract
Multiply
Divide



Personal Target: What are you going to focus on today?

If you can, have a go at the calculations you are going to see and then you can check your answer on the next page.

Or, if you are struggling, go on to the next page to see how you should be completing each calculation.

$$\frac{9}{11} - \frac{4}{11} =$$



1 mark

Strategy and answer on next page.

As the denominators are the same, you simply have to subtract the numerators.

Leave the denominator as it is!

$$\frac{9}{11} - \frac{4}{11} = \frac{5}{11}$$

Does it matter which way round you calculate with the fractions?

Yes it does – as with all subtraction, you are subtracting the smallest fraction from the largest. So, do not swap them around!

$$\frac{5}{7} + \frac{3}{21} =$$

A grid for working out the problem. A blue box highlights a 2x4 area in the bottom right corner of the grid.

Strategy and answer on next page.

$$\frac{5}{7} + \frac{3}{21} =$$

The denominators are different, so we need to start by converting the fractions so that both denominators are the same.

Look at the denominators - can you use one of them?

Yes – we can use the denominator of 21.

$$\frac{5 \times 3}{7 \times 3} + \frac{3}{21} =$$

The denominator in the second fraction will stay the same, but you need to convert the first fraction to have a denominator of 21 by asking what you multiply 7 by to get 21? Then make sure you also multiply the numerator of that fraction by 3 as well.

$$\frac{15}{21} + \frac{3}{21} = \frac{18}{21} = \frac{6}{7}$$

Once both denominators are the same, just add the numerators.

Don't forget to simplify your answer.

Note: we have looked at addition here, but the same strategy applies to subtraction.

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



Strategy and answer on next page.

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

The denominators are different, so we need to start by converting the fractions so that both denominators are the same. In this case we can't use either of the existing denominators so you need to find a common denominator by asking what number both the denominators are factors of. *In this case, 2 and 5 are both factors of 10 – this is the lowest common denominator.*

$$\frac{1 \times 5}{2 \times 5} + \frac{1 \times 2}{5 \times 2} =$$

Look at the first fraction. Change the denominator to 10 by multiplying 2 by 5. Because you have done that to the denominator, you need to do the same to the numerator so multiply that by 5 as well. Then do the same to the second fraction – to change the denominator to 10 you would multiply 5 by 2 and then do the same to the numerator.

$$\frac{5}{10} + \frac{2}{10} = \frac{7}{10}$$

Once both denominators are the same, just add the numerators. *Don't forget to simplify your answer if necessary.*

Note: we have looked at addition here, but the same strategy applies to subtraction.

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



Strategy and answer on next page.

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

When adding mixed numbers, you need to convert any mixed numbers to improper fractions. Change your first fraction (the mixed number) to an improper fraction by multiplying the denominator by the whole number (4×1), then adding the numerator ($4 + 3 = 7$).

$$\frac{7}{4} + \frac{3}{4} = \frac{10}{4}$$

Now you can follow the strategy for adding fractions.

$$\frac{10}{4} = 2\frac{2}{4} = 2\frac{1}{2}$$

As your answer is an improper fraction, you will need to change it back to a mixed number. Do this by dividing the numerator by the denominator ($10 \div 4 = 2$ with a remainder of 2). The 2 is your whole number and the remainder 2 becomes the numerator in a fraction with 4 as your denominator.

Don't forget to simplify your answer if necessary.

Note: we have looked at addition here, but the same strategy applies to subtraction.

$$1\frac{1}{15} - \frac{2}{5} =$$



Strategy and answer on next page.

$$1\frac{1}{15} - \frac{2}{5} =$$

When subtracting mixed numbers, you need to convert any mixed numbers to improper fractions. Change your first fraction (the mixed number) to an improper fraction by multiplying the denominator by the whole number (15×1), then adding the numerator ($15 + 1 = 16$).

$$\frac{16}{15} - \frac{2 \times 3}{5 \times 3} =$$

The denominators are different, so we need to start by converting the fractions so that both denominators are the same. In this case you can use the denominator of 15.

$$\frac{16}{15} - \frac{6}{15} = \frac{10}{15} = \frac{2}{3}$$

Once both denominators are the same, just subtract the numerators.

Don't forget to simplify your answer.

Note: we have looked at subtraction here, but the same strategy applies to addition.

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

A grid for working out the problem, consisting of 10 columns and 10 rows. A blue rectangular box is drawn on the right side of the grid, spanning 4 columns and 2 rows.

Strategy and answer on next page.

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

Again, you need to convert any mixed numbers to improper fractions. So for the first fraction you would need to do $3 \times 4 + 2 = 14/3$ and for the second fraction, $7 \times 1 + 6 = 13/7$.

$$\frac{14}{3} - \frac{13}{7} =$$

Again, the denominators are different, so we need to start by converting the fractions so that both denominators are the same. In this case you need to look for the lowest common denominator which is 21, then multiply each denominator to total 21 and do the same to each numerator.

$$\frac{98}{21} - \frac{39}{21} = \frac{59}{21} = 2\frac{17}{21}$$

Once both denominators are the same, just subtract the numerators.

Don't forget to simplify your answer, if necessary.

Note: we have looked at subtraction here, but the same strategy applies to addition.

$$\frac{4}{6} \times \frac{3}{5} =$$

1 mark

Strategy and answer on next page.

$$\frac{4}{6} \times \frac{3}{5}$$

$$4 \times 3 = 12$$

$$6 \times 5 = 30$$

For multiplication you simply need to multiply the numerators and then multiply the denominators.

$$\frac{4}{6} \times \frac{3}{5} = \frac{12}{30} = \frac{2}{5}$$

Don't forget to simplify your answer, if necessary.

$$\frac{2}{5} \times 140 =$$

1 mark

Strategy and answer on next page.

$$\frac{2}{5} \times 140$$

When multiplying by a whole number, this is actually an improper fraction with a denominator of 1. Multiply the numerators.

$$2 \times 140 = 280$$

$$\frac{2}{5} \times 140 = \frac{280}{5}$$

Then if you were to multiply the denominators you are multiplying by 1. So your denominator will stay the same. Your answer is an improper fraction.

$$280 \div 5 = 56$$

Convert your improper fraction by dividing the numerator by the denominator. So in this case your answer is a whole number.

Note, if you have a remainder when you do your division calculation, this becomes a fraction in the answer.

$$\frac{1}{4} \div 2 =$$

A grid of 20 columns and 10 rows, with a blue rectangular box highlighting the bottom-right portion of the grid.



1 mark

Strategy and answer on next page.

$$\frac{1}{4} \div 2$$

Again, your whole number is actually an improper fraction with a denominator of 1.

$$\frac{1}{4} \div \frac{2}{1}$$

When dividing fractions you need to remember the three letters: K C F – **Keep, Change, Flip**.

$$\frac{1}{4} \times \frac{1}{2}$$

Keep the first fraction the same, change the \div symbol to a \times (division to multiply) and flip the second fraction upside down.

$$1 \times 1 = 1$$

Then deal with the calculation as a multiplication. Multiply the numerators and then multiply the denominators.

$$4 \times 2 = 8$$

$$\frac{1}{4} \div 2 = \frac{1}{8}$$

Don't forget to simplify your answer, if necessary.

Your task:

You have a choice of 5 worksheets, each one harder than the other.

You can start to work through from the beginning or choose which one to do.

One thing to remember: 'of' can also be read as \times (multiplied by).

Plenary:

Create a poster to show one of the methods of calculating fractions.

Don't forget to send your posters to your teachers.