Sparx Maths

Crossover Workbook 1

Number

sparxmaths.com

In this series of six workbooks, there are a range of questions from key crossover topics that appear in both the GCSE Foundation and Higher tier papers.

Each workbook will focus on a particular strand of maths.

Workbook 1 will cover **Number** topics.

The contents of Workbooks 1-6 are shown below.

1 Number

- Fractions
- Factors, multiples and primes
- Percentage change
- Standard form
- Error intervals

2 Algebra

- Solving linear equations
- Linear inequalities
- Index laws
- Linear simultaneous equations
- Linear graphs and coordinates
- Quadratic graphs and equations

3 Ratio & Proportion

- Ratio
- Speed
- Density and pressure
- Proportion

4 Geometry

- Area
- Volume
- Angles
- Pythagoras' theorem
- Trigonometry
- Transformations

5 Probability

- Calculating probabilities
- Expected outcomes
- Tree diagrams
- Set notation

6 Statistics

- Averages
- Averages with grouped data
- Sampling
- Scatter graphs
- Frequency polygons

This workbook is split into two sections:

- **Introduce** questions are fluency questions on each topic to practise the key concepts.
- **Deepen** mixed topic questions are more challenging reasoning and problem solving questions.

Use the list below to keep track of your progress in each topic. If you use Sparx Maths you can find even more questions by searching for the Sparx topic codes in Independent Learning.

	Sparx topic codes	Teacher comment
Fractions	U224 U538 U793	
Factors, multiples and primes	U739 U250	
Percentage change	U671 U332 U988	
Standard form	U330 U534 U264 U290	
Error intervals	U657	

 = Non-calculator

 = Calculator

Q1

Calculate $1\frac{1}{9} \times \frac{2}{5}$

Give your answer in its simplest form.

Answer: .....

Q2

What is $\frac{6}{7} \div 2\frac{2}{5}$

Give your answer in its simplest form.

Answer: .....

Q3

Work out $2\frac{1}{8} - 1\frac{7}{12}$

Give your answer in its simplest form.

Answer: .....

Q1

By drawing a prime factor tree, find the prime decomposition of 132 in index form.

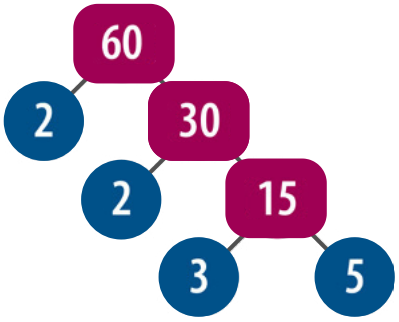
Answer: .....

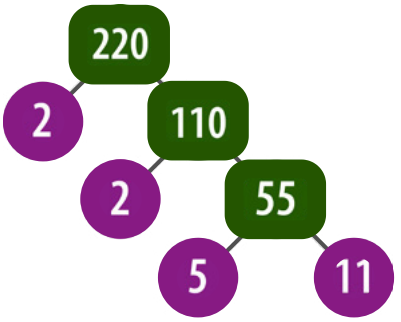
Q2

The prime factor trees for 60 and 220 are given below.

a) Work out the highest common factor (HCF) of 60 and 220

b) Work out the lowest common multiple (LCM) of 60 and 220





Answer: a) .....

Answer: b) .....

Q1

Increase 54 by 14%

Answer: .....

Q2

What number is 7% smaller than 96?

Answer: .....

Q3

Bradley takes out a loan of £700. This debt increases by 24% every year.

How much money will Bradley owe after 12 years?
Give your answer in pounds to the nearest 1p.

Answer: £ .....

Q4

A factory currently produces 250 tonnes of carbon dioxide each year.

It plans to decrease its carbon dioxide production by 2% each year.

If it is successful, how much carbon dioxide will the factory produce in 18 years' time?
Give your answer to 1 decimal place.

Answer: ..... tonnes

Q1

a) Convert 63 100 to standard form.

Answer: .....

b) What is 0.000 807 in standard form?

Answer: .....

Q2

a) What is 8.502×10^4 written as an ordinary number?

Answer: .....

b) Write 7.15×10^{-6} as an ordinary number.

Answer: .....

Q3

Calculate the following, giving your answers in standard form.

a) $(4 \times 10^3) \times (7 \times 10^5)$

Answer: .....

b) $(4 \times 10^{14}) \div (8 \times 10^2)$

Answer: .....

c) $(8.9 \times 10^7) - (7.3 \times 10^6)$

Answer: .....

Q1

A number, r, rounded to the nearest integer is 28

Complete the inequality to show the error interval for r.

$\square \leq r < \square$

Q2

A number, p, rounded to 1 decimal place is 13.2

Write down the error interval for p.

Answer: .....

Q3

A number, t, rounded to the nearest integer is 60

Write down the error interval for t.

Answer: .....

Q4

A number, x, rounded to 2 significant figures is 4700

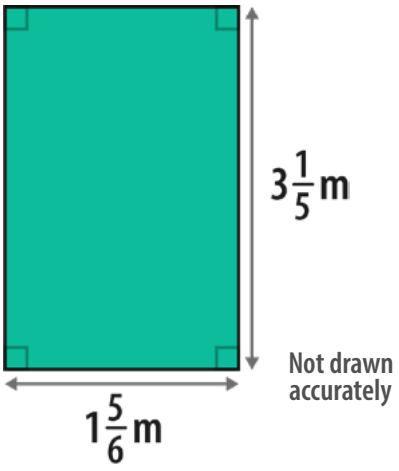
Write down the error interval for x.

Answer: .....

Q1

Calculate the area of the rectangle below.

Give your answer as a mixed number in its simplest form.



Answer: ..... m^2

Q2

The prime factor decomposition of two numbers, G and H, are shown below.

$G = 2^5 \times 3^3 \times 5$

$H = 2^2 \times 3^6 \times 5 \times 7$

Work out the

a) lowest common multiple (LCM) of G and H.

b) highest common factor (HCF) of G and H.

Give your answers as products of their prime factors in index form.

Answer: a) .....

Answer: b) .....

Q3

Megan opens a saving account which gives compound interest of 2.5% per year.

She puts £2000 into it.

How much interest will Megan have earned from this account account after 7 years?

Give your answers in pounds to the nearest 1p.

Answer: £ .....

Q4

The number of people who attended a sporting event was 120 000, rounded to 2 significant figures.

a) Write down the least possible number of people that attended the event.

Answer: .....

b) Write down the greatest possible number of people that attended the event.

Answer: .....

Q5

A biologist works out that a human blinks approximately 9×10^6 times per year.

Use this value to calculate approximately how many times a human blinks in 3 years.
Give your answer in standard form.

Answer: .....

Q6

What is $1\frac{3}{5} + 1\frac{2}{5} \div \frac{3}{4}$?

Give your in its simplest form.

Answer: .....

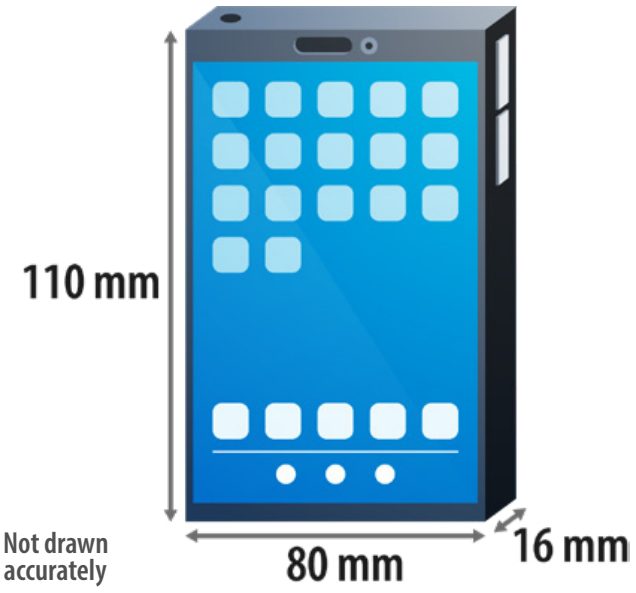
Q7

Circle all of the values below that are equivalent to 6.1×10^{-4}

61×10^{-5}	0.61×10^{-5}	0.000 061
0.000 61	0.61×10^{-3}	61×10^{-3}

Q8

Last year, a technology company created the cuboid-shaped mobile phone shown below.



This year, they released a new cuboid shaped phone which is thinner and has a bigger screen.

The company said, "The length and the width of the new phone are now 30% bigger, but the thickness is 24% smaller."

Work out the volume of the new phone to the nearest mm^3.

Answer: ..... mm^3

Q9

A number, d, is 45 when rounded to the nearest 5

Write down the error interval for d.

Answer: .....

Q10

Daniel takes out a loan of $1650

The compound interest rate on the loan is 6% per annum for the first 5 years.
After this, it increases to 13% per annum.
Daniel pays back the loan 8 years after he took it out.

How much money does he have to pay back?
Give your answer to the nearest $1.

Answer: $ .....

Q11

Work out the range of the numbers below.

Give your answer in standard form.

1.9×10^5 | 81 000 | 6×10^4

5.8×10^4 | 1 000 000

Answer: .....

Q12

The prime factor decomposition of 104 is $2^3 \times 13$

Use this to work out the prime factor decomposition of 208
Give your answer in index form.

Answer: .....

1 hour of Sparx Maths a week significantly improves student grades

Can save up to 200 hours of teacher time per year

Covers ages 11–16 for UK and international mathematics curricula

Provides powerful, actionable insights for school leaders and teachers

The market leaders in maths

Also includes times tables practice to support numeracy skills