Edexcel - Higher

Number

2022 GCSE Advance Information

Sparx Topics & Key Questions

We are always looking for ways to support maths teachers and students. In order to help you and your year 11s this year we've pulled together a list of key questions which may be useful to practise with your students based on the exam board topic lists.

These 57 key questions are all taken from our library of over 45,000 high-quality questions in Sparx Maths. If you are a Sparx Maths School then your students can use the Topic Codes provided to search the full content library directly within the independent learning section of Sparx Maths to help target their revision.

Please note this is not an exhaustive topic guide it is simply designed to help you pull together some key questions to use to check for understanding in lessons, starters, or as worksheets with your learners.

Number	Topics	Sparx Topic Codes
Fractions	Fraction of an amount	U881
	Fraction arithmetic	U475, U224, U544, U538, U874
	Recurring decimal to fraction	U689
Properties	Product of prime factors	U739, U250
	Laws of indices	U235, U694
	Negative and fractional indices	U694, U985, U772
Powers and roots	Simplification of surds	U338
Standard form	Conversion	U330, U534
	Calculation	U264, U290
Approximation and estimation	Error interval	U657, U587
	Bounds	U587
Other	Use of a calculator	U926
	Product rule for counting	U369

Fractions - Fraction of an amount

Finding fractions of amounts without a calculator U881

A school has a total of 600 students.

$\frac{1}{4}$ of the students in the school are in Year 5.

$\frac{3}{5}$ of the Year 5 students are going on a trip to the zoo.

How many Year 5 students are going on the trip?

Maryam got $\frac{3}{5}$ of the questions in a maths test correct.

If she got 75 questions correct, how many questions were there in total in the test?

Fractions - Fraction arithmetic

Multiplying fractions U475

Work out $\frac{8}{13} \times \frac{7}{55} \times \frac{11}{2}$

Give your answer as a fraction in its lowest terms.

Multiplying with mixed numbers U224

What is $6 \times \frac{7}{2}$?

Give your answer as a whole number or as a fraction in its simplest form.

Work out the value of $1\frac{3}{8} \times 5$

Give your answer as a whole number or as a fraction in its lowest terms.

Work out $3\frac{3}{8} \times 2\frac{2}{9}$

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

Dividing fractions U544

Milly is making smoothies for a festival. She has $\frac{20}{3}$ boxes of strawberries.

Each litre of smoothie needs $\frac{5}{18}$ boxes of strawberries.

How much smoothie, in litres, can Milly make?
Give your answer as an integer or as a fraction in its simplest form.

Work out $\frac{8}{9} \div 3$

Give your answer as a fraction in its simplest form.

Dividing with mixed numbers U538

Work out $7\frac{1}{2} \div 1\frac{2}{7}$

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

Problem solving: Fractions and mixed numbers U874

Which of the numbers below is closest to 1?

$$\frac{7}{9}, \quad \frac{10}{9}, \quad 1\frac{1}{6}, \quad \frac{2}{3}$$

Hugo had $2\frac{3}{35}$ litres of paint.
He used $\frac{2}{5}$ litres of the paint on his kitchen walls and $1\frac{1}{7}$ litres of the paint on his bedroom walls.

How much paint, in litres, does he have left?
Give your answer as a fraction in its simplest form.

Fractions - Recurring decimal to fraction

Converting recurring decimals to fractions U689

Calculate $0.\dot{2}\dot{3} + 0.\dot{2}$

Give your answer as a fraction in its lowest terms.

Put the values below into ascending order.

$\frac{1}{3}$ $\frac{5}{33}$ $0.\dot{1}\dot{2}$

Properties - Product of prime factors

Prime factor decomposition U739

What number has the prime decomposition $5^2 \times 41$?

a) Work out the prime factor decomposition of 252. Give your answer in index form.

b) The prime factor decompositions of five numbers are shown below. Use your answer to part a) to work out which **two** of these numbers are factors of 252.

$24 = 2^3 \times 3$

$22 = 2 \times 11$

$9 = 3^2$

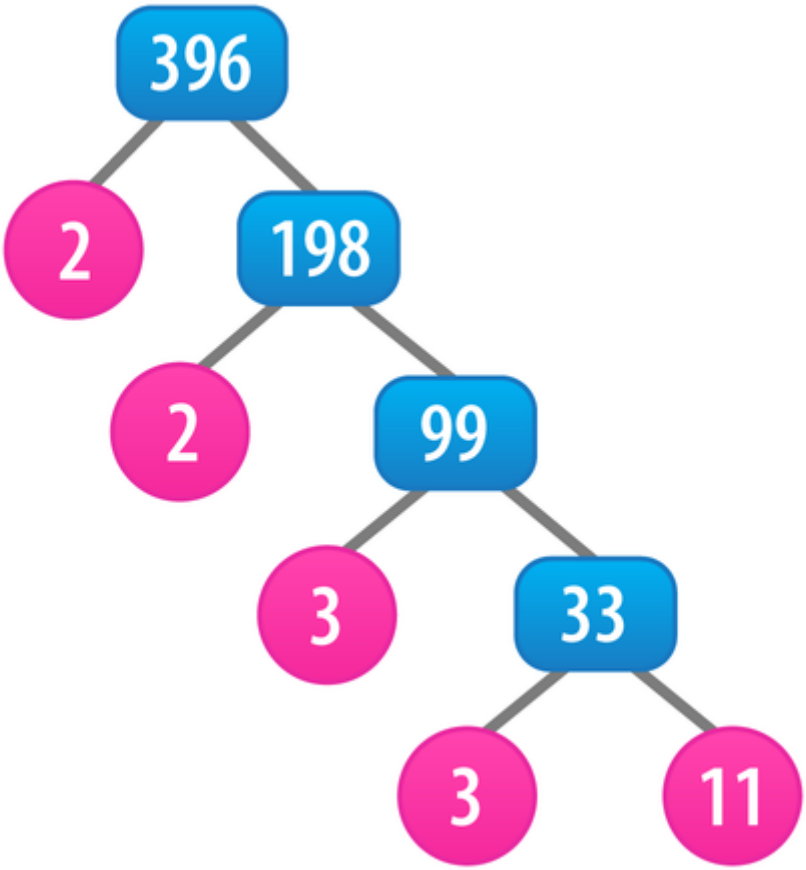
$14 = 2 \times 7$

$49 = 7^2$

Finding the HCF and LCM using prime factor decomposition **U250**

The prime factor tree for 396 is given below.

Draw the prime factor tree for 90 and use it to work out the **highest common factor (HCF)** of 90 and 396.



Draw the prime factor trees for 40 and 220.

Use the prime factor trees to find the **lowest common multiple (LCM)** of 40 and 220.

Damian has 2 rolls of ribbon. He has $63\ \text{m}$ of pink ribbon and $105\ \text{m}$ of green ribbon.

He wants to cut all of the ribbon into smaller pieces of equal length, with no ribbon left over.

Work out the greatest possible length that Damian could make the smaller pieces of ribbon.
Give your answer in metres (m).

60 and 63 are both factors of a positive integer, h.

Work out the smallest possible value of h.

Properties - Laws of indices

Index rules with positive indices U235

Work out the value of f in the equality below.

$$\frac{6^{10} \times 6^{8}}{6^{2}} = 6^{f}$$

What is the value of d in the equality below?

$$(7^{4} \times 7^{5})^{3} = 7^{d}$$

Index rules with negative indices U694

Write 5^{-3} as a fraction in its simplest form, without any indices.

What is the value of c in the equality below?

$$(16^{3})^{-7} = 16^{c}$$

Properties - Negative and fractional indices

Index rules with negative indices U694

Write 5^{-3} as a fraction in its simplest form, without any indices.

What is the value of c in the equality below?

$$(16^3)^{-7} = 16^c$$

Indices of the form $\frac{1}{a}$ U985

Work out the **value** of $25^{\frac{1}{2}}$

Give your answer as a whole number or as a fraction in its simplest form.

Work out the value of $64^{-\frac{1}{3}}$

Give your answer as a whole number or as a fraction in its simplest form.

Indices of the form $\frac{a}{b}$ U772

What is the value of $64^{\frac{2}{3}}$?

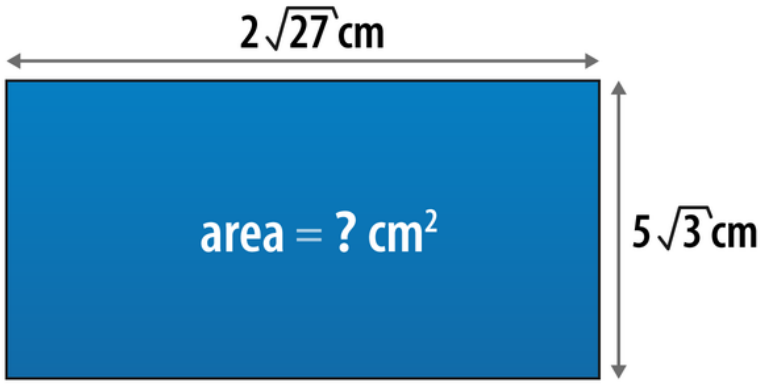
Give your answer as a whole number or as a fraction in its simplest form.

Powers and roots - Simplification of surds

Simplifying surds U338

Calculate the area, in cm^2, of the rectangle below.

Give your answer as an integer or as a surd in its simplest form.



Not to scale

Fully simplify $\frac{12\sqrt{84}}{3\sqrt{7}}$

Standard form - Conversion

Using standard form with positive indices U330

Summer estimates that she takes 6.29×10^6 steps in a year.

What is this value written as an ordinary number?

Write $68{,}000$ in standard form.

Write 8010 in standard index form.

Using standard form with negative indices U534

What is 7.031×10^{-4} as an ordinary number? Give your answer as a decimal.

What is $0.000\,807$ in standard index form?

Write 2.063×10^{-5} as an ordinary number.

Write 8010 in standard index form.

What is $0.000\,807$ in standard index form?

Standard form - Calculation

Multiplying and dividing numbers in standard form U264

Calculate $(4 \times 10^5) \times (9 \times 10^2)$

Give your answer in standard index form.

Calculate $(6 \times 10^{20}) \div (3 \times 10^4)$

Give your answer in standard form.

Adding and subtracting numbers in standard form U290

Work out $(7.8 \times 10^7) - (3.1 \times 10^6)$

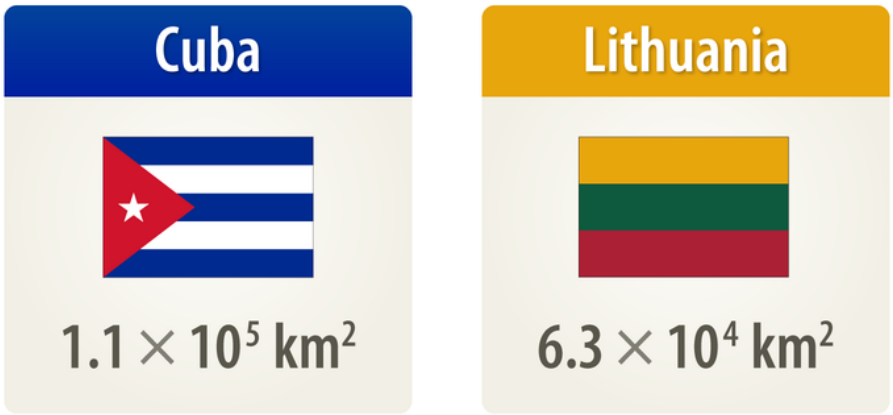
Give your answer in standard form.

A company sold 2.7×10^7 pots of yoghurt in 9 days.

On average, how many pots of yoghurt were sold each day?
Give your answer in standard index form.

The approximate areas of two countries in 2017 are given below.

Use this information to work out the **difference** between the area of Cuba and the area of Lithuania.
Give your answer in km^2 in standard form.



Calculate $(7 \times 10^4)^2 - (4 \times 10^8)$

Give your answer in standard index form.

Approximation and estimation - Error interval

Finding error intervals U657

A number, h, rounded to 2 significant figures is 0.072

Write down the error interval for h.

Finding error intervals for calculations U587

Jill buys a mobile phone that weighs 210 g to 2 significant figures.
She puts the phone inside a protective case that weighs 15.4 g to 1 decimal place.

Work out the smallest possible total weight, in grams (g), of the phone and case combined.

At the start of an experiment, some chemicals had a mass of 73 g, rounded to 2 significant figures.

During the experiment, the mass of the chemicals **decreased** by 8.2 g, rounded to 2 significant figures.

Calculate the lower and upper bounds of the mass of the chemicals at the end of the experiment.

Colin has 10 metal rods. Each rod is $90\ \text{cm}$ long when rounded to the nearest centimetre (cm). He lays out the rods in a straight line, end to end.

What is the **smallest** possible **total** length, in cm, of the line of rods?

A formula connecting speed (s), distance (d) and time (t) is

$$s = \frac{d}{t}$$

$d = 190\ \text{metres}$ to 2 significant figures
$t = 8.1\ \text{seconds}$ to 2 significant figures

Calculate the lower and upper bounds of s.
Give your answers to 3 significant figures.

Approximation and estimation - Bounds

Finding error intervals for calculations U587

Jill buys a mobile phone that weighs 210 g to 2 significant figures.
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Calculate the lower and upper bounds of s.
Give your answers to 3 significant figures.

Other - Use of a calculator

Using a calculator U926

Find the value of 3.24×10^4

Find the square root of 40. Give your answer rounded to 2 decimal places.

Other - Product rule for counting

Using the product rule for counting U369

The hot drinks sold by a cafe are 5 types of tea and 2 types of coffee. The cafe also sells 9 types of cake.

a) If a customer chooses a tea and a cake, how many different combinations are there?

b) If a customer chooses a hot drink and a cake, how many different combinations are there?

To unlock a door, you must enter a 5–digit code on the keypad shown below. The code contains five **different** digits which must be entered in the correct order.

How many possible codes are there?