recognise integers as positive or negative whole numbers, including zero	
work out the answer to a calculation given the answer to a related calculation	
multiply and divide integers, limited to 3-digit by 2-digit calculations	
multiply and divide decimals, limited to multiplying by a single digit integer, for example 0.6 × 3 or 0.8 ÷ 2 or 0.32 × 5 or limited to multiplying or dividing by a decimal to one significant figure, for example 0.84 × 0.2 or 6.5 ÷ 0.5	
interpret a remainder from a division problem	
recall all positive number complements to 100	
recall all multiplication facts to 10 × 10 and use them to derive the corresponding division facts	
add, subtract, multiply and divide using commutative, associative and distributive laws	
understand and use inverse operations	
use brackets and the hierarchy of operations	
solve problems set in words; for example, formulae given in words	
understand reciprocal as multiplicative inverse	
understand that any non-zero number multiplied by its reciprocal is 1	
know that zero has no reciprocal because division by zero is undefined	
perform money calculations, writing answers using the correct notation	
round numbers to the nearest whole number, 10, 100 or 1000 or million	
round to one, two or three decimal places	
round to one significant figure	
Round to a given number of significant figures or decimal places	
Round to a suitable degree of accuracy	
write in ascending order positive or negative numbers given as fractions, including improper fractions, decimals or integers	

recognise integers as positive or negative whole numbers, including zero	
work out the answer to a calculation given the answer to a related calculation	
multiply and divide integers, limited to 3-digit by 2-digit calculations	
multiply and divide decimals, limited to multiplying by a single digit integer, for example 0.6 × 3 or 0.8 ÷ 2 or 0.32 × 5 or limited to multiplying or dividing by a decimal to one significant figure, for example 0.84 × 0.2 or 6.5 ÷ 0.5	
interpret a remainder from a division problem	
recall all positive number complements to 100	
recall all multiplication facts to 10 × 10 and use them to derive the corresponding division facts	
add, subtract, multiply and divide using commutative, associative and distributive laws	
understand and use inverse operations	
use brackets and the hierarchy of operations	
solve problems set in words; for example, formulae given in words	
understand reciprocal as multiplicative inverse	
understand that any non-zero number multiplied by its reciprocal is 1	
know that zero has no reciprocal because division by zero is undefined	
perform money calculations, writing answers using the correct notation	
round numbers to the nearest whole number, 10, 100 or 1000 or million	
round to one, two or three decimal places	
round to one significant figure	
Round to a given number of significant figures or decimal places	
Round to a suitable degree of accuracy	
write in ascending order positive or negative numbers given as fractions, including improper fractions, decimals or integers	
identify multiples, factors and prime numbers from lists of numbers	
write out lists of multiples and factors to identify common multiples or common factors of two or more integers	
write a number as the product of its prime factors and use formal and informal methods for identifying highest common factors (HCF) and lowest common multiples (LCM); abbreviations will not be used in examinations	

quote squares of numbers up to 15×15 and the cubes of 1, 2, 3, 4, 5 and 10, also knowing the corresponding roots	
recognise the notation $\sqrt{25}$ and know that when a square root is asked for only the positive value will be required; candidates are expected to know that a square root can be negative	
solve equations such as $x^2 = 25$, giving both the positive and negative roots	
understand the notation and be able to work out the value of squares, cubes and powers of 10	
use the index laws for multiplication and division of integer powers	
use the index laws for multiplication and division of integer powers	
write an ordinary number in standard form	
write a number written in standard form as an ordinary number	
order numbers that may be written in standard form	
simplify expressions written in standard form	
solve simple equations where the numbers may be written in standard form	
simplify surds	
rationalise a denominator	
Formulae will be given in the question if needed	
simplify expressions using the rules of surds	
expand brackets where the terms may be written in surd form	
solve equations which may be written in surd form	
Identify equivalent fractions	
Write a fraction in its simplest form	
Convert mixed numbers and improper fractions	
Compare fractions	
add and subtract fractions by writing them with a common denominator	
convert mixed numbers to improper fractions and add and subtract mixed numbers	
convert between fractions and decimals using place value	
identify common recurring decimals	

know how to write decimals using recurring decimal notation	
interpret percentage as the operator ‘so many hundredths of’	
use percentages in real-life situations	
know that fractions, decimals and percentages can be interchanged	
interpret a fraction, decimal or percentage as a multiplier when solving problems	
use fractions, decimals or percentages to compare proportions	
convert between fractions, decimals and percentages to find the most appropriate method of calculation in any given question	
calculate a fraction of a quantity	
work out one quantity as a fraction of another quantity	
use fractions to calculate proportions	
understand and use unit fractions as multiplicative inverses	
multiply and divide a fraction by an integer, by a unit fraction and by a general fraction	
calculate a fraction of a quantity	
calculate a percentage of a quantity	
use decimals to find quantities	
solve percentage increase and decrease problems	
use, for example, 1.12 × Q to calculate a 12% increase in the value of Q and 0.88 × Q to calculate a 12% decrease in the value of Q	
work out one quantity as a fraction, decimal or percentage of another quantity	
use fractions, decimals or percentages to calculate proportions	
use reverse percentages to calculate the original amount	
understand the meaning of ratio notation	
interpret a ratio as a fraction	
simplify a ratio to its simplest form, $a : b$, where a and b are integers	
write a ratio in the form $1 : n$ or $n : 1$	
interpret a ratio in a way that enables the correct proportion of an amount to be calculated	

use ratio and proportion to solve word problems	
use direct proportion to solve problems	
use notations and symbols correctly	
understand that letter symbols represent definite unknown numbers in equations, defined quantities or variables in formulae, and in functions they define new expressions or quantities by referring to known quantities	
understand phrases such as ‘form an equation’, ‘use a formula’ and ‘write an expression’ when answering a question	
Higher tier candidates should understand the identity symbol (see examples in 5.5h)	
understand that the transformation of algebraic expressions obeys and generalises the rules of generalised arithmetic	
manipulate an expression by collecting like terms	
multiply a single term over a bracket	
write expressions using squares and cubes	
factorise algebraic expressions by taking out common factors	
multiply two linear expressions such as $(x \pm a)(x \pm b)$ and $(cx \pm a)(dx \pm b)$ at Higher tier	
factorise quadratic expressions using the sum and product method or by inspection (FOIL)	
factorise quadratics of the form $ax2 + bx + c$	
factorise expressions written as the difference of two squares	
cancel rational expressions by looking for common factors	
apply the four rules to algebraic fractions, which may include quadratics and the difference of two squares	
solve simple linear equations by using inverse operations or by transforming both sides in the same way	
solve simple linear equations with integer coefficients where the unknown appears on one or both sides of the equation or where the equation involves brackets	
set up simple linear equations to solve problems	
solve simultaneous linear equations by elimination or substitution or any other valid method	
solve simultaneous equations when one is linear and the other quadratic, of the form y = ax2 + bx + c where *a*, *b* and *c* are integers	
solve quadratic equations by factorising, completing the square or using the quadratic formula	
use formulae from mathematics and other subjects expressed initially in words and then using letters and symbols	

substitute numbers into a formula	
change the subject of a formula	
know the difference between $<$ $\leq$ $\geq$ $>$	
solve simple linear inequalities in one or two variables	
represent the solution set of an inequality on a number line, knowing the correct conventions of an open circle for a strict inequality and a closed circle for an included boundary	
draw or identify regions on a 2-D coordinate grid, using the conventions of a dashed line for a strict inequality and a solid line for an included inequality	
use algebraic expressions to support an argument or verify a statement	
construct rigorous proofs to validate a given result	
generate common integer sequences, including sequences of odd or even integers, squared integers, powers of 2, powers of 10 and triangular numbers	
generate simple sequences derived from diagrams and complete a table of results describing the pattern shown by the diagrams	
work out an expression in terms of *n* for the *n*th term of a linear sequence by knowing that the common difference can be used to generate a formula for the *n*th term	
plot points in all four quadrants	
find coordinates of points identified by geometrical information, for example the fourth vertex of a rectangle given the other three vertices	
find the coordinates of a midpoint, for example the midpoint of the diagonal of a parallelogram, given the coordinates of the end points of the diagonal	
recognise that equations of the form $y = mx + c$ correspond to straight line graphs in the coordinate plane	
plot graphs of functions in which *y* is given explicitly in terms of *x* or implicitly	
complete partially completed tables of values for straight line graphs	
calculate the gradient of a given straight line using the y-step method	
recognise that equations of the form $y = 3x - 1$ correspond to straight line graphs in the coordinate plane	
plot graphs of functions in which *y* is given explicitly in terms of *x* or implicitly	
complete partially completed tables of values for straight line graphs	
calculate the gradient of a given straight line using the y-step method	
manipulate the equations of straight lines so that it is possible to tell whether lines are parallel or not	
plot a graph representing a real-life problem from information given in words or in a table or as a formula	
identify the correct equation of a real-life graph from a drawing of the graph	

read from graphs representing real-life situations; for example, the cost of a bill for so many units of gas or working out the number of units for a given cost, and also understand that the intercept of such a graph represents the fixed charge	
draw linear graphs with or without a table of values	
interpret linear graphs representing real-life situations; for example, graphs representing financial situations (e.g. gas, electricity, water, mobile phone bills, council tax) with or without fixed charges, and also understand that the intercept represents the fixed charge or deposit	
plot and interpret distance-time graphs	