2027 Entry

13+ Entrance Examination

Guidelines and Sample Questions

English
Maths
Verbal Reasoning
Science
Modern Languages

13+ Exam Guidelines

The 13+ Entrance Examination consists of papers in Mathematics, English, Science, a Modern Language and Verbal Reasoning. It is expected that pupils will be of above average academic ability at this age but the aim is to test potential rather than specific knowledge. At the end of this booklet you will find a sample Maths paper and sample Verbal Reasoning paper. For all subjects, details of the papers are provided below.

Candidates are expected to bring normal writing implements with them e.g. pen, pencil, ruler and rubber.

13+ English Examination (1 hour)

The examination will last 1 hour and there are two sections:

Section A: Reading (40 minutes)
Candidates are given a short reading passage (fiction) and asked a series of questions based on this. This is based on the style of questions found in the beginning of the AQA English Language GCSE Paper 1. The questions will test explicit understanding of the passage, asking for fact retrieval, before asking for a response to language and literary techniques, requiring quotations and close engagement with these. The final section asks entrants to consider the structure of the extract, using quotations in support.

Section B: Writing (20 minutes)
In Section B, pupils will demonstrate the accuracy and imagination of their writing by completing a short descriptive or narrative task. We are looking for engaging and lively ideas, varied and controlled grammatical features, and a broad, ambitious vocabulary that is spelled correctly. Paragraphing and appropriate punctuation will be used to make the sequence of events or ideas coherent and clear to the reader. We acknowledge that the response will be relatively short with just 20 minutes.

13+ Mathematics Examination (1 hour)

The written paper will consist mainly of short questions, with working and answers to be shown on the question paper. There is no choice of questions. **Calculators are not permitted**. The syllabus is as follows:

NUMBER

- Whole number calculations including multiplication and division of 3 digit numbers by 2 digit numbers
- Prime numbers, multiples and factors, squares and cubes, highest common factors, lowest common multiples
- Negative (signed) numbers and their arithmetic
- Decimals: addition, subtraction, simple multiplication and division. Simple

recurring decimals
- The decimal system used with money; length (mm, cm, m, km); mass (g, kg); capacity (ml, l)
- Degree of accuracy: significant figures and decimal places. Estimating answers to multiplication and division problems
- Standard index form
- Manipulation of fractions (the four rules for regular and mixed fractions)
- Calculating percentages of quantities
- Ratios expressed as fractions, decimals and percentages
- Direct proportion
- Elementary problems involving time, distance and speed
- The 24-hour clock, timetables, travel graphs, conversion graphs

ALGEBRA
- Introduction to algebraic notation: the four operations +, -, x, ÷ used algebraically
- Sequences and rules for generating them
- Using simple formulae or equations expressed in symbolic form
- Using coordinates in all four quadrants
- Solving linear equations
- Expressing a simple function symbolically
- Plotting cartesian coordinates to represent simple mappings

SHAPE & SPACE
- Measuring and drawing angles, properties of angles associated with intersecting and parallel lines and triangles, 3 figure bearings
- Recognising the following shapes: cuboids, cube, sphere, cylinder, cone, and pyramid
- Classifying types of quadrilateral
- Vocabulary of 3D solids: faces, edges, and vertices
- Calculating areas and perimeter of plane shapes: square, rectangle, triangle, circle
- Calculating volume of cubes and cuboids
- Symmetry properties of plane figures (including interior and exterior angles of regular polygons)

HANDLING DATA
- Extracting data from diagrams; such as bar charts, pictograms, line graphs and frequency diagrams
- Constructing and interpreting pie charts
- Collecting, grouping and ordering discrete data to create a frequency table
- Understanding and using the probability scale from 0 to 1
- Listing all possible outcomes of an event and simple probabilities
- Averages: mean, median, mode. Spread: range

Notes:
The examination may contain questions on any parts of the above syllabus. However, at the time of the examination it is not necessarily expected that candidates will have covered quite every item. The variety of questions should enable the competent candidate to demonstrate his/her ability.

13+ Science Examination (1 hour)

SPECIFICATION

The examination is based on the National Curriculum, with the emphasis on skills and processes. The aim is to test potential, as well as knowledge. Questions will test skills and the ability to apply understanding in unfamiliar settings.

SUBJECT CONTENT

Questions will be spread equally between Physics, Chemistry and Biology, the subject content being based on Key Stage 3 of the National Curriculum.

Topics covered include:

- Keeping healthy
- Studying disease
- Separating mixtures
- Atoms, elements & compounds
- Magnetism
- Sound and heat
- Life and death
- Variation in living things, classification of living organisms and food chains
- Cells, tissues, organs
- Photosynthesis
- Electricity
- Chemical reactions
- Reproduction in humans
- States of matter and changes of state
- Acids, alkalis and neutralization reactions in everyday life
- Energy changes

SKILLS

- Graph plotting
- Identifying variables
- Fair testing
- Interpreting results of experiments and writing conclusions
- Familiarity with basic laboratory equipment

EXAMINATION FORMAT

The examination will last 1 hour and has a maximum mark of 100. Mark allocations are provided throughout. Most questions are of a short answer style, but a few require an extended explanation or description. Candidates will need a calculator.

13+ Modern Languages Examination (45 minutes)

MODERN LANGUAGES

One written paper, lasting 45 minutes will be taken by every candidate. Students are able to choose from either French, Spanish or German papers. Further details are provided below:

FRENCH

Pupils entering the school in Year 9 will be expected to be familiar with the following grammar points:

- Nouns: gender; singular and plural
- Articles: partitive article *du/de la/des* to indicate *some*
- Adjectives: agreement and position before and after nouns; colours
- Subject pronouns: *je, tu, il/elle*, etc
- Verbs: infinitives; regular and irregular verbs in the present tense; *faire, aller, être* and *avoir* in the present tense; *aller* with infinitive to indicate future; perfect tense using *avoir* and *être*
- Negatives with *ne… pas*
- Modal verbs: *pouvoir, devoir* and *vouloir*
- Questions: with and without question words
- Numbers/days/dates/times

Vocabulary for the exam will be drawn from the following topic areas:

- Personal information: birthdays, family,
- Family, relationships pets
- Pastimes and hobbies
- School: subjects studied, favourite subject
- Home life: describing where you live
- Holidays

Please prepare to do a piece of writing of 150-200 words on one or two of the following topics. You should aim to use a variety of different language, use more than one tense, and aim to write as accurately as you can. You can choose to include any information relevant to your chosen topics.

- Myself, my family and my friends
- My free time, hobbies and leisure
- Where I live
- My holidays
- My school
- My future plans
- The environment

GERMAN

Pupils entering the school in Year 9 will be expected to be familiar with the following grammar points:

- Nouns: gender; singular and plural
- Articles and Cases: definite and indefinite articles; nominative, accusative and dative cases; negative articles (*kein*); possessive adjectives
- Adjectives: both before and after nouns
- Pronouns: nominative pronouns; 'it'; *man*; *du* and s*ie*
- Verbs: infinitives; regular and irregular verbs in the present tense; *sein* and *haben* in the present tense; present tense for future plans; talking about the past (*war*/*hatte*); imperatives; modal verbs
- Word Order: normal word order; verb as second idea
- Questions: both with and without question words
- *Es gibt…*
- *Gern*
- Negatives with *nicht*
- Numbers/Days/Dates/Times/Adverbs of Frequency

Vocabulary will be drawn from the following topic areas:

- *Hallo!:* introductions; self; age; where you live; spelling; school bag; birthday
- *Die Schule:* school subjects and opinions; timetable; telling the time; breaktime snacks; school uniform
- *Familie und Freunde:* family members; describing appearance and characteristics; pets
- *Freizeit:* sports; hobbies and favourite things; holidays ; making arrangements
- *Mein Zuhause:* where you live – area and types of house; rooms and activities; describing rooms; furniture
- *Stadt und Land:* geography of Germany, Austria and Switzerland; weather; buildings in town; transport; directions; food and drink; money

Please prepare to do a piece of writing of 150-200 words on one or two of the following topics. You should aim to use a variety of different language, use more than one tense, and aim to write as accurately as you can. You can choose to include any information relevant to your chosen topics.

- Myself, my family and my friends
- My free time, hobbies and leisure
- Where I live
- My holidays
- My school
- My future plans
- The environment

SPANISH

Pupils entering the school in Year 9 will be expected to be familiar with the following grammatical points and language:

- Nouns; gender, singular and plural
- Agreement between nouns and adjectives
- Subject pronouns: (*yo, tú, él*, etc)
- Verbs in the present tense, regular verbs
- Some common irregular verbs including *ser, ir, jugar, querer*
- Use of the infinitive after *gustar, antes de, después de*
- Question words
- Numbers, days of the week, dates
- Prepositions of time

Vocabulary for the exam will be drawn from the following topic areas:

- Personal information
- The family
- Pets
- School
- Leisure activities

Please prepare to do a piece of writing of around 150 words on one or two of the following topics. You should aim to use a variety of different language, use more than one tense, and aim to write as accurately as you can. You can choose to include any information relevant to your chosen topics.

- Myself, my family and my friends
- My free time, hobbies and leisure
- Where I live
- My holidays
- My school
- My future plans
- The environment

13+ Mathematics Examination (1 hour)

This selection of questions has been provided to give you a sample of the standard and style of our 13+ examination in Mathematics. Vocabulary with which familiarity is expected has been **emboldened.** NO CALCULATORS OR DRAWING INSTRUMENTS

1. Solve the following equations

   a. $b + 3 = 10$ **1a**

   b. $y - 5 = 7$ **1b**

   c. $2p - 3 = 13$ **1c**

   d. $2 + \frac{1}{2}q = 7$ **1d**

   e. $5 - 2x = x - 4$ **1e**

2. a. Find $\frac{3}{5}$ of 45 kg **2a**

   b. Find 15% of £120 **2b**

3. Find the **total cost** for 30 school children to visit Alton Towers at £8.50 per child. **3**

4. A car travels 360 km at 45 km/h. How long does the journey take? **4**

5. You are given that $3{\cdot}24 \times 12{\cdot}78 = 41{\cdot}4072$.
   Use this information to state the exact values of the following:

   a. $32{\cdot}4 \times 127{\cdot}8$ **5a**

   b. $0{\cdot}0324 \times 1278$ **5b**

   c. $414{\cdot}072 \div 1{\cdot}278$ **5c**

6. Given that $T = 5x - 4y$, find the values of T when:

   a. $x = 3, y = 2$ **6a**

   b. $x = {}^{-}2, y = {}^{-}4$ **6b**

   c. $x = 3, y = {}^{-}\frac{1}{2}$ **6c**

   d. $x = 1{\cdot}1, y = 0{\cdot}8$ **6d**

7. Complete this table for a series of rectangles:

Rectangle	**Perimeter**	**Area**
5 cm by 8 cm	26 cm	40 cm^2
4 cm by 7 cm	22 cm	
3 cm by 8 cm		24 cm^2
	30 cm	54 cm^2

8. Find the next number in these **sequences**:

   a. 5, 7, 9, 11, … **8a**

   b. 1, 2, 4, 7, 11, … **8b**

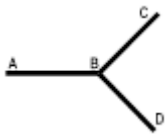
   c. 1, 3, 7, 15, 31, … **8c**

   d. 2, 4, 6, 10,16, 26,… **8d**

9. a. What is the (**obtuse**) angle between the hands of a clock at 5:00?

9a

b. 3 streets AB, CB and DB meet at B as shown. AB runs east, BC runs north-east and BD runs south-east. What is the angle ∠ABD ?



9b

10. I buy 13 biros at 25p each. What change do I receive from £10?

10

11. Find the values of:

a. $8 - 3$ **11a**

b. $3 - 8$ **11b**

c. $8 - {}^{-}3$ **11c**

d. ${}^{-}8 + {}^{-}3$ **11d**

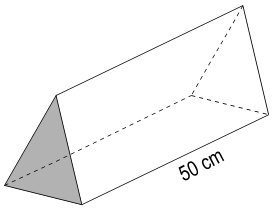
e. $8 \times {}^{-}3$ **11e**

f. ${}^{-}8 \div 4$ **11f**

g. ${}^{-}4 \div {}^{-}8$ **11g**

h. ${}^{-}4 \times {}^{-}8$ **11h**

12. A triangular **prism** has length 50 cm as shown. How many **faces**, **vertices**, **edges** does the prism have?
Given that the area of the triangle is 70 cm^2, calculate the **volume** of the prism, giving your answer both in cm^3 and in **litres**.



12

_____Faces

_____Vertices

_____Edges

Volume =

13. Calculate

a. 427×6 **13a**

b. 375×62 **13b**

c. 80×1200 **13c**

d. $784 \div 7$ **13d**

14. On this grid plot A (${}^{-}3$,1), B(${}^{-}1$, 0) and C(0, 2).

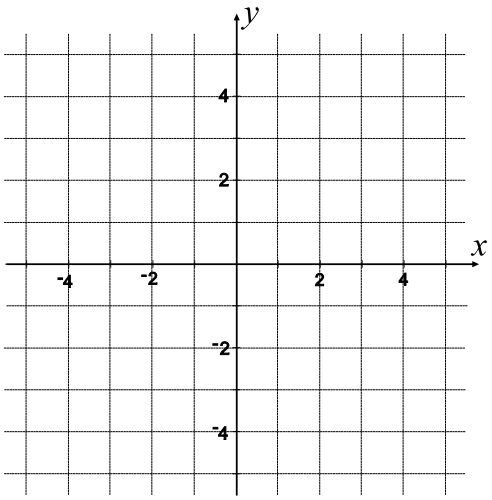
Now mark the point D which makes ABCD a square.

Give the **co-ordinates** of D.

Plot E (4, 0). Mark the point F (on the *y*-axis) making CEF an **isosceles triangle** with CE = FE.

What are the co-ordinates of F?

What special name is given to the figure CEFB?



15. A large patio measures 8 m by 15 m.
It is to be covered with slabs measuring 1 m by 1½ m. How many slabs will be needed?

15

16. John is looking due north. He then takes a quarter turn clockwise, and finally 140° anticlockwise.
At what angle to north is John now facing?

16

17. **Simplify** the following:

a. $2k + 3 - k + 5$ 17a

b. $3x - 4x + 7x - 2x$ 17b

18. a. Simplify this **fraction** as much as possible: $\frac{32}{84}$ 18a

b. Find: $\frac{5}{8} - \frac{1}{4}$ $\frac{3}{4} \times \frac{8}{15}$ $2\frac{1}{3} \div \frac{7}{9}$, *giving your answers in* **simplest form**. 18b , ,

19. Calculate

a. $489 + 742$ 19a

b. $738 - 269$ 19b

20. **Round** 84256 to the nearest 100 20

21. A **cuboid** has dimensions of 5 cm by 4 cm by 6 cm.

a. Draw an accurate full scale **net** of the cuboid.

b. Find the **surface area** of the cuboid. 21b

22. a. Write down all the **factors** of 40 22a

b. Write all the **prime numbers** between 20 and 40 22b

c. Find the **highest common factor** of 56 and 80 22c

d. How many **multiples** of 6 are less than 80? 22d

e. Find the **lowest common multiple** of 9 and 12 22e

f. Write down the first six **square numbers** 22f

g. Write down the first five **cube numbers** 22g

23. Find the value of 320 + 16 x 40 23

24. Evaluate:

a. $8{\cdot}74 + 5{\cdot}56$ **24a**

b. $7{\cdot}34 - 3{\cdot}49$ **24b**

c. $48{\cdot}4 \div 40$ **24c**

d. $3{\cdot}5 \div 0{\cdot}05$ **24d**

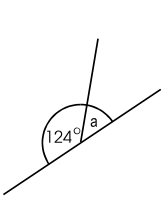
25. How many superballs at 16 pence each could be bought for £4.80? **25**

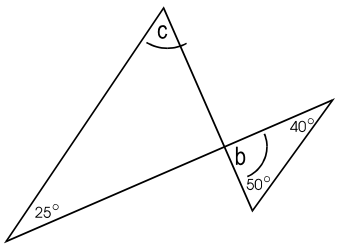
26. Find the **mean**, **median**, **mode** and **range** of the following data sets:

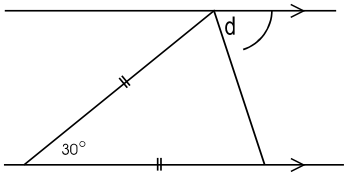
a. 5, 7, 9, 11, 11 **26a** mean = median = mode = range=

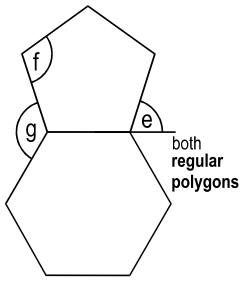
b. 1, 1, 2, 3, 4, 5, 5, 5, 6, 10 **26b** mean = median = mode = range=

27. **Calculate** the values of the marked angles a, b, c, d, e, f, g:









27a ° **27b** ° **27c** ° **27d** ° **27e** ° **27f** ° **27g** °

28. Convert 1·6 km into

a. metres **28a**

b. cm **28b**

29. How many **axes of symmetry** do the following have: **rhombus**, **square**, **kite**, **equilateral triangle**

rhombus **square** **kite** **triangle**

30. One letter is chosen at random from the letters of the word MATHEMATICS. What is the **probability** that the letter is:

a. an I? **30a**

b. an M? **30b**

31. A train left London at 10:24 and arrived in Manchester at 13:10. How long did the journey last? **31**

32. a. Write $\frac{2}{5}$ as (i) a **decimal**, and (ii) a **percentage** **32a**

b. Write 35% as (i) a decimal, and (ii) a **fraction** in its lowest terms **32b**

Verbal Reasoning Sample Paper

VERBAL REASONING
This is a 45 minute paper to test the ability to reason and is used to indicate potential. The pupil is given an opportunity to practise on the day on a 15 minute paper. A sample of a practice paper is attached.

You have 15 minutes in total to complete the Verbal Reasoning Practice Paper below.

1 Fill in the crossword so that all the missing words are included:

ADD
WED
BOA
ODD
BOW

O	D	E

In each question below, underline the **two** words that must change places to make the sentence sensible.

EXAMPLE

Of course you can pen my borrow

2 He loud in a very speaks voice

3 The ball bounced the wall and hit off

4 It will weight four people to lift the take

In each question below, write in both empty boxes **one** letter that will complete the first word and begin the second word. **The same letter must fit into both empty boxes.**

EXAMPLE

MEA	*t*	ABLE	SI	*t*	OP

5 OVE		EED	DEE		EAR
6 FEL		APE	OU		IE

In each question below, underline the **two** words, **one** from each set, that are **most opposite in meaning.**

EXAMPLE

morning	early	wake	late	stop	dark

7 top	bottom	fall	rise	lift	down
8 safe	secure	hazardous	vault	protective	dangerous
9 direct	pleasant	courteous	displeased	impolite	straight

In each sentence below, a word of **four letters** is hidden at the **end** of one word and the **beginning** of the next word. Write the hidden word in the boxes, one letter in each box. The order of the letters must **not** be changed.

EXAMPLES

Cease at once — s e a t

The film ended happily — m e n d

10 She saw the door open

11 They decided to go altogether

12 It was fun dressing up at the party

In each question below, one word, which is in **CAPITALS**, has had **three** letters next to each other taken out. These **three** letters will make one correctly spelled word without changing the order. Write the **three-letter** word in the spaces provided.

EXAMPLE

The cat scratched him with his **CS** — l a w

13 The **JNY** took seven hours on the train

14 Everyone was **GARED** together

15 They found it difficult **FOLING** the path

The number codes **6245, 4123, 4133** represent three of the four words **TAIL, TALL, LATE, KITE.**

16 Find the number code for the word **TAIL**

17 Find the number code for the word **KITE**

18 Find the number code for the word **LEAK**

In each question, **one** word in the right hand box will got equally well with both pairs of words in the left-hand box. Find this **one** word and <u>underline</u> it.

EXAMPLE

colour hue	light dark	night tint stain <u>shade</u> rainbow
19 dim faded	collapse unconscious	weak light faint drop ill
20 coarse vulgar	shared mutual	joint common ugly equal rude

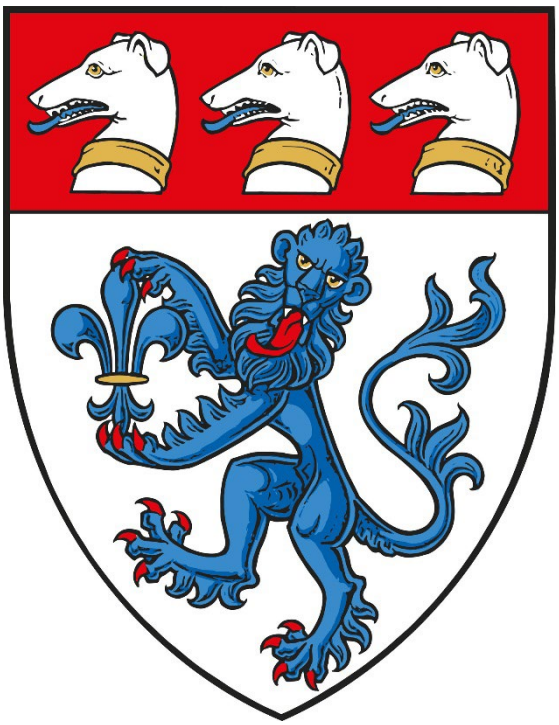
13+ Sample Paper Answers

Maths

1. a. b = 7 b. y = 12 c. p = 8 d. q = 10 e. x = 3
2. a. 27kg b. £18
3. £255
4. 8 hours
5. a. 4140.72 b. 41.4072 c. 324
6. a. 7 b. 6 c. 17 d. 2.3
7. 28cm^2, 22 cms, 6 cms by 9 cm
8. a. 13 b. 16 c. 63 d. 42
9. a. 150° b. 135°
10. £6.75
11. a. 5 b. -5 c. 11 d. -11 e. -24 f. -2 g. ½ h. 32
12. 5, 6, 9, 3500cm^3 = 3.5 litres
13. a. 2562 b. 23250 c. 96000 d. 112
14. (-2,3), (0,-2), KITE
15. 80
16. 50°
17. a. k + 8 b. 4x
18. a. 8/21 b. 3/8, 2/5, 3
19. a. 1231 b. 469
20. 84300
21. a. more than 1 answer applies b. 148cm^2
22. a. 1, 2, 4, 5, 8, 10, 20, 40 b. 23, 29, 31, 37 c. 8 d. 13
    e. 36 f. 1, 4, 9, 16, 25, 36 g. 1, 8, 27, 64,125
23. 960
24. a. 14.3 b. 3.85 c. 1.21 d. 70
25. 30
26. a. 8.6, 9, 11, 6 b. 4.2, 4.5, 5, 9
27. a. 56° b. 90° c. 65° d. 75° e. 72° f. 108° g. 132°
28. a. 1600 b. 160000
29. 2, 4, 1, 3
30. a. 1/11 b. 2/11
31. 2 hrs 46 mins
32. a. 0.4, 40% b. 0.35, 7/20

Verbal Reasoning (answers)

1. BOW
   ODE
   ADD
2. loud, speaks
3. bounced, hit
4. weight, take
5. R, R
6. T, T
7. fall, rise
8. safe, dangerous
9. courteous, impolite
10. rope
11. goal
12. fund
13. OUR
14. THE
15. LOW
16. 4123
17. 6245
18. 3516
19. faint
20. common



The King's School in Macclesfield

www.kingsmac.co.uk
01625 260000
admissions@kingsmac.co.uk