



11+ MATHEMATICS SAMPLE PAPER

Below is a sample 11+ entrance exam paper which has been completed with answers and comments from the Maths Department to guide you on how to achieve the best possible marks throughout the paper.

Q1 Subtract, one hundred and eighty-seven from three hundred and forty-two

$$\begin{array}{r}
 2342 \\
 - 187 \\
 \hline
 155
 \end{array}$$

1 mark for correct method. 1 mark for correct answer.

155 (2)

Q2 Multiply, two hundred and fifty-three by nineteen

$$\begin{array}{r}
 253 \\
 \times 19 \\
 \hline
 2530 \\
 2277 \\
 \hline
 4807
 \end{array}$$

2 marks for correct method shown. 1 mark for correct answer.

4807 (3)

Q3 Fill in the digits to complete this calculation

$$\begin{array}{r}
 3421 \\
 - 253 \\
 \hline
 168
 \end{array}$$

(3)

- Q4 40 euros can be exchanged for £35.
How many pounds can be obtained for 100 euros?

Ratio

$$\begin{aligned} \text{€}80 &\rightarrow \text{£}70 \\ \text{€}20 &\rightarrow \text{£}17.50 \\ &\underline{\text{£}87.50} \end{aligned}$$

Make sure that
the correct
units are always
included.

(2)

- Q5 Calculate $5712 \div 7$

$$\begin{array}{r} 816 \\ 7 \overline{)5712} \end{array}$$

Correct use of formal
division.
No marks for 'chunking'.

816

(2)

- Q6 Calculate $1302 \div 14$

$$\begin{array}{r} 93 \\ 14 \overline{)1302} \\ \underline{126} \\ 42 \end{array}$$

Show workings. No
marks for 'chunking'.

93

(2)

- Q7 Calculate 26×1.3

$$\begin{array}{r} 26 \\ 1.3 \\ \hline 78 \\ 260 \\ \hline 33.8 \end{array}$$

Multiplication
of decimals.

33.8

(2)

- Q8 Calculate $32 - 20 \times 0.4 + 3^2$

$$\begin{aligned} 32 - 8 + 9 & \text{ —————} \\ & = 33 \end{aligned}$$

1 mark for clearly
showing correct use
of BIDMAS

33

(3)



Q9 You buy 5 packs of apples and 4 packs of oranges. Apples are packed in fours and oranges are packed in sixes. How many items of fruit do you get in total?

Problem Solving with worded questions.

Show steps

$$5 \times 4 + 4 \times 6$$

$$= 20 + 24 = 44$$

44 (2)

Q10 Given that $54 \times 2018 = 108972$, find the answer to 18×2018 without multiplying. Show your method.

Identifying and use of $18 = 54/3$ No marks for multiplying 2018 by 18.

$$18 \times 2018 = 108972 \div 3$$

$$\begin{array}{r} 36324 \\ 3 \overline{)108972} \end{array}$$

36324 (2)

Q11 Arrange the following numbers in order from smallest to largest:

0.7 $\frac{17}{20}$ 0.8 $\frac{7}{9}$ 0.77 $\frac{7}{8}$

2 marks for converting all terms into common format.

0.7, 0.85, 0.8, 0.7, 0.77, 0.875

Convert back to original format for final answer.

$$0.7, 0.77, \frac{7}{9}, 0.8, \frac{17}{20}, \frac{7}{8} \quad (3)$$

Q12 Change the following to decimals

(i) $\frac{81}{100}$

0.81 (1)

(ii) $\frac{17}{50}$

0.34 (1)

(iii) $\frac{9}{20}$

0.45 (2)



Allow 1 mark for correct follow through from incorrect 1st term.

Q13

(i) Write down the next three numbers in the sequence:

3, 15, 27, 39, 51, 63, 75

(2)

(ii) If the sequence were continued, how many numbers would there be in total to reach the number 315? (including 315)

$$315 - 3 = 312$$

$$312 \div 12 = 26 \rightarrow 27 \text{ terms}$$

27

(2)

Q14 Angles in a triangle sum to 180 degrees.

If an isosceles triangle has one angle of 68 degrees, what are the other two angles?

$$180 - 68 = 112$$

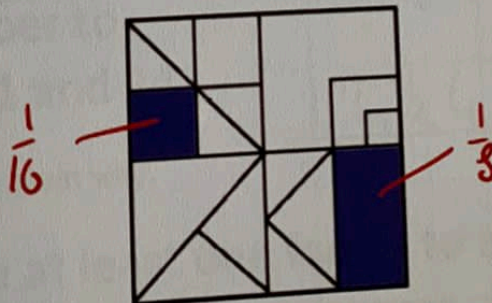
$$112 \div 2 = 56^\circ \rightarrow \text{Both angles are } 56^\circ$$

or $2 \times 68 = 136^\circ$

$$180 - 136 = 44^\circ \rightarrow \text{One angle is } 68^\circ, \text{ the } 2^{\text{nd}} \text{ is } 44^\circ$$

(2)

Q15 Giving your answer in its simplest form, what fraction of the following shape is shaded?



$\frac{1}{16}$

$\frac{1}{8}$

1 mark for any fraction correctly identified.

$$\frac{1}{8} + \frac{1}{16} = \frac{3}{16}$$

$\frac{3}{16}$

(2)



Q16 The following chart shows the favourite instrument for pupils in a class

Instrument	Tally	Frequency
drum		5
guitar		4
flute		3
clarinet		2
trumpet		5
violin		4
xylophone	I	1

(i) How many pupils are there in the class?

$$5 + 4 + 3 + 2 + 5 + 4 + 1 = 24$$

1 mark for showing correct calculation.

24 _____ (2)

(ii) What fraction of pupils have violin as their favourite instrument?

$$\frac{4}{24} = \frac{1}{6}$$

$\frac{1}{6}$

_____ (2)

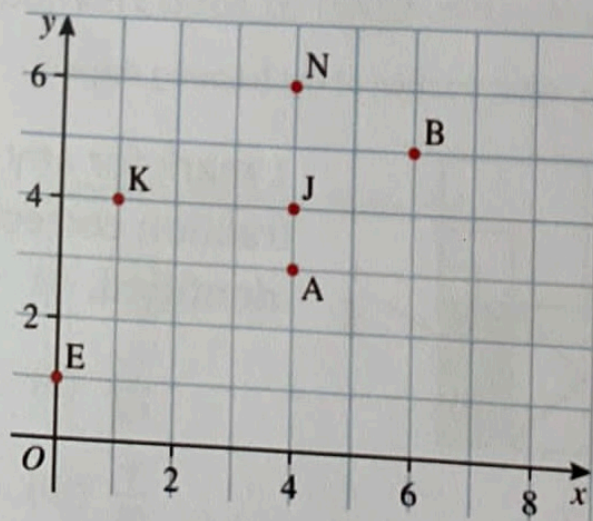
(iii) What is the probability that a pupil chosen at random has a favourite instrument that is the guitar or clarinet?

$$\frac{4 + 2}{24} = \frac{6}{24}$$

$\frac{1}{4}$

_____ (2)

Q17 Write down the coordinates of each point



A(4, 3) B(6, 5) E(0, 1) J(4, 4) K(1, 4) N(4, 6) _____ (3)



Q18

Here are the ingredients to make dumplings to accompany a stew.

100 grams of self-raising flour

$\frac{1}{4}$ teaspoon salt

50 grams of suet

$\frac{1}{3}$ teaspoon dried mixed herbs

Serves 4 people

Ginny wants to make dumplings for 6 people. Work out the amounts of each ingredient she needs.

1 mark for identifying that 1 1/2 lots of each ingredient is required.

Flour	150
Salt	$\frac{3}{8}$
Suet	75
Herbs	$\frac{1}{2}$

(5)

Q19

- (i) If the temperature yesterday was -5°C and rises by 9°C overnight, what is the temperature today?

Missing units will be penalised 1 mark.

4°C (1)

- (ii) The weather forecast then says that the temperature will fall by 7°C between today and tomorrow. What will the temperature be tomorrow?

-3°C (2)

Q20

- (i) List all multiples of 14 which are less than 80

Remember to include 1 x 14

14, 28, 42, 56, 70 (2)

- (ii) List all the factors of 24
Remember to include 1 and 24

1, 2, 3, 4, 6, 8, 12, 24 (3)

- (iii) Is 287 prime? Explain why.

Must state at least one factor to show it is not prime.

No, it is divisible by 7 (or 41) (2)



- Q21 Bike hire costs £3.20 per hour plus a one-off fee of £2 per bike. How much would it cost in total for three people to ride bikes for four hours?

$$\begin{aligned} \text{Cost for 1 person} &= 2 + 4 \times 3.20 = 14.80 \\ \text{Cost for 3 people} &= 3 \times 14.80 = \pounds 44.40 \end{aligned}$$

Must have £ sign

£44.40 (3)

- Q22 Your flight departure time is 9.20am. You must check in 2 hours before departure. The taxi journey to the airport takes 40 minutes and you allow 25 minutes between arriving at the airport and checking in. What is the latest time you can get the taxi to make your flight on time?

$$\begin{array}{ccccccc} & \xrightarrow{-25} & & \xrightarrow{-40\text{min}} & & \xrightarrow{-2\text{hrs}} & \\ 6:15 & & 6:40 & & 7:20 & & 9:20 \end{array}$$

Must include 'am' notation or 06:15.

6:15am / 06:15 (3)

Q23

- (i) How many minutes are there in 2 and a quarter hours?

$$60 + 60 + 15 = 135$$

135 (2)

- (ii) How many centimetres are there in total in 350mm and 1.7m?

$$350\text{mm} = 35\text{cm} \quad 1.7\text{m} = 170\text{cm}$$

$$35 + 170 = 205 \quad \underline{205} \quad (1)$$

- (iii) The perimeter of a square is 6.4m. If you walk around the edge and each step you take is 80cm, how many steps do you take?

$$6.4\text{m} = 640\text{cm}$$

$$640 \div 80 = 8$$

8 steps (3)



Q24 There are 30 pupils in a class. Because of delays $\frac{1}{5}$ are late for school. Of those on time $\frac{3}{4}$ are leaving to go on a school trip. How many pupils are left in class?

$$\frac{4}{5} \text{ of } 30 = 24 \quad \frac{1}{6} \text{ of } 24 = 6$$

6 pupils are left (3)

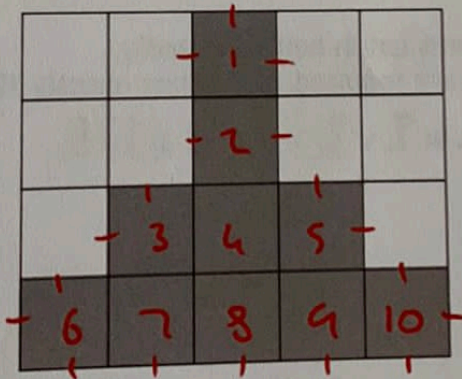
Q25 20% of visitors to a museum are young (under the age of 25). If 160 young people visited the museum, how many older people visited the museum?

80% of visitors are older

$$\rightarrow 4 \times 160 = 640 \text{ older visitors}$$

640 (2)

Q26 Assuming that each square is 1cm by 1cm, find the area and perimeter of the shaded shape.



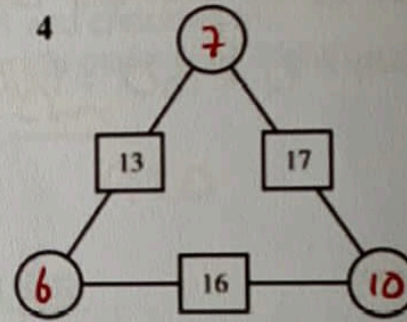
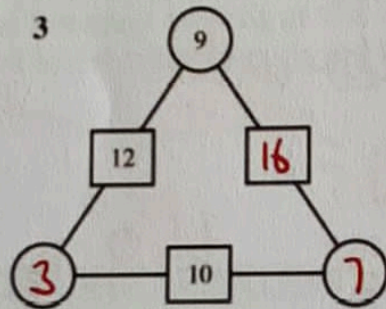
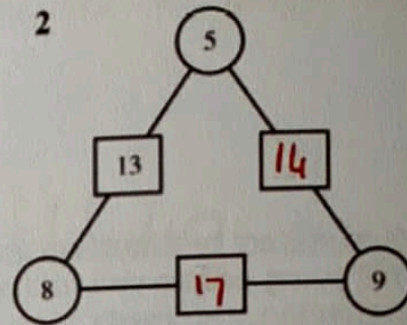
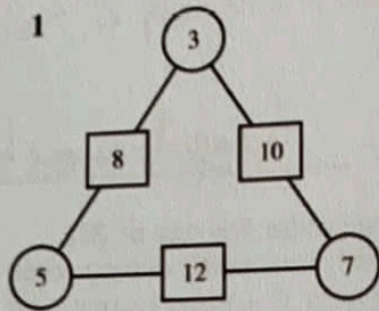
Area: 10 cm² (2)

Perimeter: 18 cm (2)

Must have the correct units.



Q27 In a triangular arithmagon, the number along each side of the triangle is obtained by adding up the numbers in the adjacent corners. The first arithmagon has been filled in, to show you how this works. See if you can complete the other three arithmagons.



(5)

Q28 A piece of paper is cut in half repeatedly. How many cuts are required to produce exactly 128 pieces?

$$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 128$$

7 cuts

(2)

Q29 Two numbers multiply to 104 and add to 21. Work out what the two numbers are.

$$13 \times 8 = 104$$

$$13 + 8 = 21$$

8, 13

(3)

1 mark for any two numbers whose product is 104 or whose sum is 21.



- Q30 Divide £80 between three people so that the second person will have twice as much as the first person and the third person will have £5 less than the second person.

Let x be the amount the first person has

$$x + 2x + 2x - 5 = 80$$

$$5x = 85$$

$$x = 17$$

Trial and error and non-algebraic methods acceptable.

So amounts are £17, £34, £29

(3)

- Q31 $a \oslash b$ means divide a by b and then add 1.

So, for example $10 \oslash 5 = 10 \div 5 + 1 = 2 + 1 = 3$

Complete the following:

$$15 \oslash 5 = \underline{4}$$

$$11 \oslash 11 = \underline{2}$$

$$9 \oslash 2 = \underline{5.5}$$

$$\underline{91} \oslash 7 = 14$$

(4)

End of Examination (Total: 100 marks)