

Pearson Edexcel style

GCSE (9-1) Mathematics

Paper 1 (Non-Calculator) Higher Tier – Practice Paper 1

1MA1/1H · Higher Tier · Practice paper

Time allowed: 1 hour 30 minutes

Candidate name	
Centre number	
Candidate number	

Materials

- Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser
- Formulae sheet (provided)
- Tracing paper may be used.
- You must not use a calculator.

Instructions

- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided – there may be more space than you need.
- You must show all your working.
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- Calculators may not be used.

Information

- The total mark for this paper is 80
- The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.
- Advice: Read each question carefully before you start to answer it. Keep an eye on the time. Try to answer every question. Check your answers if you have time at the end.

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Answer ALL questions.

*Write your answers in the spaces provided. You must write down all the stages in your working.
Time: 1 hour 30 minutes.*

1

(a) Write 540 as a product of its prime factors.

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(2)

(b) Mrs Khan has 540 pencils and 252 rulers.

She puts all of them into identical packs, with nothing left over.

Each pack has the same number of pencils and the same number of rulers.

What is the greatest number of packs she can make?

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(3)

(Total for Question 1 = 5 marks)

2 Work out $3\frac{1}{3} \div 1\frac{1}{4}$

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

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(3)

(Total for Question 2 = 3 marks)

3 Printer A prints 270 pages in 6 minutes.
Printer B prints 630 pages in 15 minutes.
Both printers start printing at the same time and work together.

How long will it take them to print 1740 pages altogether?

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(3)
(Total for Question 3 = 3 marks)

4 AB and CD are parallel straight lines.
The straight line EF crosses AB at P and CD at Q.
A and D are on opposite sides of EF.
Angle APQ = $(2x + 30)^\circ$
Angle PQD = $(4x - 10)^\circ$

Work out the size of angle BPQ.
Give a reason for each stage of your working.

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(4)
(Total for Question 4 = 4 marks)

5 The table shows information about the number of goals a football team scored in each of its 20 matches.

Number of goals	Frequency
0	5
1	8
2	4
3	2
4	1

(a) Write down the mode.

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(1)

(b) Work out the mean number of goals scored per match.

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(3)

(Total for Question 5 = 4 marks)

6 The mean of 6 numbers is 13
One of the numbers is removed.
The mean of the 5 numbers left is 12

Work out the number that was removed.

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(2)

(Total for Question 6 = 2 marks)

7 The probability that it rains on any day is 0.6

If it rains, the probability that Ella's bus is late is 0.3

If it does not rain, the probability that Ella's bus is late is 0.6

Work out the probability that Ella's bus is late on a given day.

(3)

(Total for Question 7 = 3 marks)

8

(a) Simplify $(3x^2y)^3$

(2)

(b) Work out the value of $25^{-1/2}$

(1)

(Total for Question 8 = 3 marks)

9 Kofi uses his calculator to work out the value of a number x .
He writes down the first 2 digits on his calculator display.
He writes 4.7

Write down the error interval for x .

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(2)

(Total for Question 9 = 2 marks)

10 There are 5 red pens and 3 black pens in a box.
Leah takes at random two pens from the box, without replacement.

Work out the probability that she takes one pen of each colour.

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(3)

(Total for Question 10 = 3 marks)

11

(a) Factorise $x^2 - 49$

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(1)

(b) Expand and simplify $(3x - 1)(2x + 3)$

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(Total for Question 11 = 3 marks)

12 The line L passes through the points $(2, 5)$ and $(6, -3)$

Find an equation of the line that is perpendicular to L and passes through the point (4, 1)

(Total for Question 12 = 4 marks)

13 A, B and C are points on a circle, centre O.
C is on the major arc AB.
Angle ACB = 58°

Work out the size of angle OAB.

Give a reason for each stage of your working.

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(4)

(Total for Question 13 = 4 marks)

14 P is inversely proportional to the cube of d.

When $d = 2$, $P = 3$

Work out the value of P when $d = 4$

(3)

(Total for Question 14 = 3 marks)

15 Make r the subject of the formula

$$V = 3\sqrt{r^2 + h}$$

(3)

(Total for Question 15 = 3 marks)

16 A cyclist starts from rest. The table shows her velocity, v m/s, at different times, t seconds.

The velocity–time graph through these points is a smooth curve that bends downwards (it lies above the straight line joining any two of the points).

t (seconds)	0	2	4	6
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v (m/s)	0	6	10	12

(a) Use 3 strips of equal width to work out an estimate for the distance the cyclist travels in the first 6 seconds.

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(3)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

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(1)

(Total for Question 16 = 4 marks)

17 The first two terms of a sequence are a and b.
Each term after the second is found by adding the two previous terms.
The 3rd term is 7
The 5th term is 18

Work out the values of a and b.

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(4)

(Total for Question 17 = 4 marks)

18

(a) Show that $(\sqrt{18} + \sqrt{8})^2 = 50$

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(2)

(b) Rationalise the denominator of $6/(2\sqrt{3})$

Give your answer in its simplest form.

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(2)

(Total for Question 18 = 4 marks)

19

(a) Write $2x^2 + 12x + 5$ in the form $a(x + b)^2 + c$, where a , b and c are integers.

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(3)

(b) Write down the coordinates of the turning point of the graph of $y = 2x^2 + 12x + 5$

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(1)

(Total for Question 19 = 4 marks)

20 In triangle PQR, PQ = 6 cm, PR = x cm and angle QPR = 30°
The area of the triangle is 12 cm^2

Work out the value of x.

(3)

(Total for Question 20 = 3 marks)

21 A two-digit number has tens digit a and units digit b.
Its digits are reversed to make a second two-digit number.

Prove that the sum of the two numbers is always a multiple of 11

(3)

(Total for Question 21 = 3 marks)

22 Solve algebraically the simultaneous equations

$$y = x^2 - 3x + 1$$

$$y = 2x - 5$$

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(5)

(Total for Question 22 = 5 marks)

23 $f(x) = (x + 4)/3$
 $g(x) = 2x - 1$

Solve $gf(x) = f^{-1}(x)$

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(4)

(Total for Question 23 = 4 marks)

END OF QUESTIONS