

Paper Reference 1MA1/2H  
Pearson Edexcel  
Level 1/Level 2 GCSE (9–1)

Total Marks
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Mathematics  
Paper 2  
(Calculator)  
Higher Tier

Thursday 6 June 2019 – Morning

Time: 1 hour 30 minutes plus your additional time allowance.

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

**YOU MUST HAVE**

**Ruler, protractor, compasses, writing and drawing equipment, calculator. Tracing paper may be used.**

**YOU WILL BE GIVEN**

**Diagram Book**

# **INSTRUCTIONS**

**Answer ALL questions.**

**Answer the questions in the spaces provided in this Question Paper or on the separate diagrams – there may be more space than you need.**

**You must SHOW ALL YOUR WORKING.**

**Diagrams and models are NOT accurate unless otherwise indicated.**

**CALCULATORS MAY BE USED.**

**If your calculator does not have a  $\pi$  button, take the value of  $\pi$  to be  $3.142$  unless the question instructs otherwise.**

**Turn over**

## **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.**

**You may be provided with a model for Question 19**

**There may be spare copies of some diagrams.**

**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.**

1. (a) Solve

$$14n > 11n + 6$$

(2 marks)

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(continued on the next page)

**Turn over**

**1. continued.**

**(b) Look at the diagram for  
Question 1(b) in the  
Diagram Book.**

**On the number line, show the set  
of values of  $x$  for which**

$$\mathbf{-2 < x + 3 \leq 4}$$

**(3 marks)**

**(Total for Question 1 is 5 marks)**

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**Turn over**



- 2. Look at the diagram for Question 2 in the Diagram Book.**

**On the grid, draw the graph of  $y = 2x - 3$  for values of  $x$  from  $-2$  to  $4$**

**(Total for Question 2 is 3 marks)**

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**Turn over**

**3. Look at the table for Question 3 in the Diagram Book.**

**Hannah is planning a day trip for 195 students.**

**She asks a sample of 30 students where they want to go.**

**Each student chooses one place.**

**The table shows information about her results.**

**(continued on the next page)**

**3. continued.**

- (i) Work out how many of the  
195 students you think will want  
to go to the Theme Park.**

**(2 marks)**

**Answer space continues on the  
next page.**

**3. (i) continued.**

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**(continued on the next page)**

**Turn over**

**3. continued.**

**(ii) State any assumption you made  
AND explain how this may affect  
your answer.**

**(1 mark)**

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**(Total for Question 3 is 3 marks)**

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**Turn over**

- 4. Look at the diagram for Question 4 in the Diagram Book.**

**It shows a container in the shape of a cuboid, with length 30 cm, width 6 cm, and height 19 cm**

**The container is  $\frac{2}{3}$  full of water.**

**A cup holds 275 ml of water.**

**What is the greatest number of cups that can be completely filled with water from the container?**

**(4 marks)**

**Answer space is on the next two pages.**

**Turn over**

4. continued.

Turn over

**4. continued.**

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**(Total for Question 4 is 4 marks)**

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**Turn over**



5. Look at the diagram for Question 5 in the Diagram Book.

**ABC** is a right-angled triangle.

**AC = 16 cm**

**Angle ACB =  $38^\circ$**

**Angle ABC is a right angle.**

**Calculate the length of AB**

**Give your answer correct to**

**2 decimal places.**

**(2 marks)**

**Answer space continues on the next page.**

**5. continued.**

\_\_\_\_\_ **cm**

**(Total for Question 5 is 2 marks)**

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**Turn over**

6. Sally used her calculator to work out the value of a number  $y$

The answer on her calculator display began

8.3

Complete the error interval for  $y$

\_\_\_\_\_  $\leq y <$  \_\_\_\_\_

(Total for Question 6 is 2 marks)

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Turn over

- 7. £360 is shared between Abby, Ben, Chloe and Denesh.**

**The ratio of the amount Abby gets to the amount Ben gets is 2 : 7**

**Chloe and Denesh each get 1.5 times the amount Abby gets.**

**Work out the amount of money that Ben gets.**

**(4 marks)**

**Answer space continues on the next two pages.**

**7. continued.**

**Turn over**

**7. continued.**

£ \_\_\_\_\_

**(Total for Question 7 is 4 marks)**

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**Turn over**

8. (a) Write

**0·00562** in standard form.

(1 mark)

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(b) Write

**$1·452 \times 10^3$**  as an ordinary  
number.

(1 mark)

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**(Total for Question 8 is 2 marks)**

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**Turn over**

**9. The circumference of circle B is 90% of the circumference of circle A**

**(a) Find the ratio of the area of circle A to the area of circle B  
(2 marks)**

**Answer space continues on the next page.**



9. (a) continued.

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(continued on the next page)

Turn over

**9. continued.**

**Square E has sides of length  $e$  cm**

**Square F has sides of length  $f$  cm**

**The area of square E is 44% greater than the area of square F**

**(b) Work out the ratio  $e : f$**

**(2 marks)**

**Answer space continues on the next page.**

9. (b) continued.

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**(Total for Question 9 is 4 marks)**

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**Turn over**

**10. Mary travels to work by train every day.**

**The probability that her train will be late on any day is  $0.15$**

**(a) Look at the diagram for Question 10(a) in the Diagram Book.**

**Complete the probability tree diagram for Thursday and Friday.  
There are five spaces to fill.  
(2 marks)**

**(continued on the next page)**

**10. continued.**

**(b) Work out the probability that her train will be late on at least one of these two days.**

**(3 marks)**

**Answer space continues on the next page.**

**10. (b) continued.**

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**(Total for Question 10 is 5 marks)**

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**11. Look at the table for Question 11 in the Diagram Book.**

**The grouped frequency table gives information about the times, in minutes, that 80 office workers take to get to work.**

**(continued on the next page)**

**11. continued.**

**(a) Complete the cumulative frequency table below.**

**There are six spaces to fill.**

**(1 mark)**

<b>Time (t minutes)</b>	<b>Cumulative frequency</b>
<b><math>0 &lt; t \leq 20</math></b>	
<b><math>0 &lt; t \leq 40</math></b>	
<b><math>0 &lt; t \leq 60</math></b>	
<b><math>0 &lt; t \leq 80</math></b>	
<b><math>0 &lt; t \leq 100</math></b>	
<b><math>0 &lt; t \leq 120</math></b>	

**(continued on the next page)**

**Turn over**



**11. continued.**

**(b) Look at the diagram for  
Question 11(b) in the  
Diagram Book.**

**On the grid, draw the cumulative  
frequency graph for this  
information.**

**(2 marks)**

**(continued on the next page)**

**11. continued.**

**(c) Use your graph to find an estimate for the percentage of these office workers who take more than 90 minutes to get to work.**

**(3 marks)**

**Answer space continues on the next page.**

**Turn over**

**11. (c) continued.**

\_\_\_\_\_ %

**(Total for Question 11 is 6 marks)**

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**Turn over**

**12. Look at the diagram for Question 12 in the Diagram Book.**

**OAB is a sector of a circle with centre O and radius 7 cm**

**The area of the sector is  $40 \text{ cm}^2$**

**Calculate the perimeter of the sector.**

**Give your answer correct to**

**3 significant figures.**

**(4 marks)**

**Answer space continues on the next two pages.**

**12. continued.**

**Turn over**

**12. continued.**

\_\_\_\_\_ **cm**

**(Total for Question 12 is 4 marks)**

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**Turn over**

**13. Show that**

$$6 + \left[ (x + 5) \div \frac{x^2 + 3x - 10}{x - 1} \right]$$

**simplifies to  $\frac{ax - b}{cx - d}$**

**where  $a$ ,  $b$ ,  $c$  and  $d$  are integers.**

**(4 marks)**

**Answer space continues on the next three pages.**

**13. continued.**

**Turn over**



**13. continued.**

**Turn over**

**13. continued.**

**(Total for Question 13 is 4 marks)**

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**Turn over**

**14. Look at the diagram for Question 14 in the Diagram Book.**

**It shows a graph.**

**A car moves from rest.**

**The graph gives information about the speed,  $v$  metres per second, of the car  $t$  seconds after it starts to move.**

**(a) (i) Calculate an estimate of the gradient of the graph at  $t = 15$**

**(3 marks)**

**Answer space is on the next page.**

**Turn over**

**14. (a) (i) continued.**

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**(continued on the next page)**

**Turn over**

**14. (a) continued.**

**(ii) Describe what your answer  
to part (i) represents.**

**(1 mark)**

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**(continued on the next page)**

**14. continued.**

**(b) Work out an estimate for the distance the car travels in the first 20 seconds of its journey. Use 4 strips of equal width.**

**(3 marks)**

**Answer space continues on the next page.**

**Turn over**

**14. (b) continued.**

\_\_\_\_\_ metres

**(Total for Question 14 is 7 marks)**

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**Turn over**

**15. Make  $m$  the subject of the formula**

$$f = \frac{3m + 4}{m - 1}$$

**(3 marks)**

**Answer space continues on the next page.**



**15. continued.**

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**(Total for Question 15 is 3 marks)**

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**Turn over**

**16. The straight line  $L$  has the equation**

$$3y = 4x + 7$$

**The point  $A$  has coordinates  $(3, -5)$**

**Find an equation of the straight line  
that is perpendicular to  $L$  and passes  
through  $A$**

**(3 marks)**

**Answer space continues on the next  
two pages.**

**16. continued.**

**Turn over**

**16. continued.**

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**(Total for Question 16 is 3 marks)**

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**17. There are some small cubes and some large cubes in a bag.**

**The cubes are red or the cubes are yellow.**

**The ratio of the number of small cubes to the number of large cubes is  $4:7$**

**The ratio of the number of red cubes to the number of yellow cubes is  $3:5$**

**(continued on the next page)**

**17. continued.**

- (a) Explain why the least possible number of cubes in the bag is 88 (1 mark)**

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**(continued on the next page)**

**17. continued.**

**All the small cubes are yellow.**

**(b) Work out the least possible  
number of large yellow cubes in  
the bag.**

**(3 marks)**

**Answer space continues on the  
next two pages.**

**Turn over**

17. (b) continued.

Turn over



**17. (b) continued.**

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**(Total for Question 17 is 4 marks)**

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**18. Look at the diagram for Question 18 in the Diagram Book.**

**The points A, B, C and D lie on a circle.**

**CDE is a straight line.**

$$\mathbf{BA = BD}$$

$$\mathbf{CB = CD}$$

$$\mathbf{\text{Angle ABD} = 40^\circ}$$

**Work out the size of angle ADE**

**You must give a reason for each stage of your working.**

**(5 marks)**

**Answer space is on the next two pages.**

**Turn over**

**18. continued.**

**Turn over**

**18. continued.**

**(Total for Question 18 is 5 marks)**

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**Turn over**

**19. Look at the diagrams for Question 19 in the Diagram Book.**

**You may be provided with a model.**

**It is not accurate.**

**Diagram 1 shows a triangular prism.**

**The base,  $ABCD$ , of the prism is a square of side length  $15\text{ cm}$ , shown in diagram 1a**

**Angle  $ABE$  and angle  $CBE$  are right angles.**

**Angle  $EAB = 35^\circ$**

**Diagram 1b shows the face  $ABE$**

**(continued on the next page)**

**19. continued.**

**M is the point on DA such that**

$$\mathbf{DM : MA = 2 : 3}$$

**Diagram 1c shows triangle MBE**

**Calculate the size of the angle  
between EM and the base of the  
prism.**

**Give your answer correct to  
1 decimal place.**

**(4 marks)**

**Answer space is on the next two  
pages.**

**Turn over**

**19. continued.**

**Turn over**

**19. continued.**

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**(Total for Question 19 is 4 marks)**

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**Turn over**



20. Look at diagram 1 for Question 20 in the Diagram Book.

**CDEF** is a quadrilateral.

$$\overrightarrow{CD} = a, \overrightarrow{DE} = b \text{ and } \overrightarrow{FC} = a - b$$

(a) Express  $\overrightarrow{FE}$  in terms of **a** and/or **b**

Give your answer in its simplest form.

(2 marks)

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(continued on the next page)

Turn over

**20. continued.**

**Below diagram 1, diagram 2 shows  
the same quadrilateral CDEF**

**M is the midpoint of DE**

**X is the point on FM such that**

$$\mathbf{FX:XM = n:1}$$

**CXE is a straight line.**

**(b) Work out the value of n**

**(4 marks)**

**Answer space continues on the  
next two pages.**

**20. (b) continued.**

**Turn over**

**20. (b) continued.**

**n = \_\_\_\_\_**

**(Total for Question 20 is 6 marks)**

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**TOTAL FOR PAPER IS 80 MARKS**

**END OF PAPER**

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