1MA1 Higher themed papers: Standard form

Write your name here

Surname | Other names

Centre Number | Candidate Number

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Mathematics

Standard form

Paper Reference
1MA1

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

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.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is **42**. There are **14** questions.
- Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
- 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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1 (*a*) Write 0.00562 in standard form.

.....

(1)

(*b*) Write 1.452×10^3 as an ordinary number.

.....

(1)

(Total for Question 1 is 2 marks)

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2 Write the following numbers in order of size.
Start with the smallest number.

0.045×10^3 4.5×10^{-3} 450 0.45×10^{-1}

.....

(Total for Question 2 is 2 marks)

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3 In May 2019, the distance between Earth and Mars was 3.9×10^7 km.

In May 2019, a signal was sent from Earth to Mars.
Assuming that the signal sent from Earth to Mars travelled at a speed of 3×10^5 km per second,

(*a*) how long did the signal take to get to Mars?

..... seconds
(2)

The speed of the signal sent from Earth to Mars in May 2019 was actually less than 3×10^5 km per second.

(*b*) How will this affect your answer to part (*a*)?

.....

.....

.....
(1)

(Total for Question 3 is 3 marks)

4 Work out $(3.42 \times 10^{-7}) \div (7.5 \times 10^{-6})$
Give your answer in standard form.

.....

(Total for Question 4 is 2 marks)

---

5 (a) Write 3.6×10^4 as an ordinary number.

.....

(1)

(b) Work out the value of $(2.8 \times 10^{-2}) \div (4.7 \times 10^5)$
Give your answer in standard form correct to 3 significant figures.

.....

(2)

(Total for Question 5 is 3 marks)

---

6 (*a*) Write 32 460 000 in standard form.

.....

(1)

(*b*) Write 4.96×10^{-3} as an ordinary number.

.....

(1)

Asma was asked to compare the following two numbers.

$$A = 6.212 \times 10^8 \quad \text{and} \quad B = 4.73 \times 10^9$$

She says,

"6.212 is bigger than 4.73 so *A* is bigger than *B*."

(*c*) Is Asma correct?
You must give a reason for your answer.

.....

.....

.....

(1)

(Total for Question 6 is 3 marks)

7 Work out $(13.8 \times 10^{7}) \times (5.4 \times 10^{-12})$
Give your answer as an ordinary number.

.....

(Total for Question 7 is 2 marks)

---

8 (*a*) Write the number $0.000\,086\,23$ in standard form.

.....

(1)

(*b*) Work out $\dfrac{3.2\times10^{3}+5.1\times10^{-2}}{4.3\times10^{-4}}$

Give your answer in standard form, correct to 3 significant figures.

.....

(2)

(Total for Question 8 is 3 marks)

---

9 Find the value of $\dfrac{(6.67\times10^{-11})\times(7.35\times10^{22})}{(1.74\times10^{6})^{2}}$

Give your answer correct to 1 decimal place.

.....

(Total for Question 9 is 2 marks)

10 The table shows some information about eight planets.

Planet	**Distance from Earth (km)**	**Mass (kg)**
Earth	0	5.97×10^{24}
Jupiter	6.29×10^{8}	1.898×10^{27}
Mars	7.83×10^{7}	6.42×10^{23}
Mercury	9.17×10^{7}	3.302×10^{23}
Neptune	4.35×10^{9}	1.024×10^{26}
Saturn	1.28×10^{9}	5.68×10^{26}
Uranus	2.72×10^{9}	8.683×10^{25}
Venus	4.14×10^{7}	4.869×10^{24}

(*a*) Write down the name of the planet with the greatest mass.

.....

(1)

(*b*) Find the difference between the mass of Venus and the mass of Mercury.

..... kg

(1)

Nishat says that Neptune is over a hundred times further away from Earth than Venus is.

(*c*) Is Nishat right?
You must show how you get your answer.

(2)

(Total for Question 10 is 4 marks)

11 (*a*) Write 7.97×10^{-6} as an ordinary number.

.....

(1)

(*b*) Work out the value of $(2.52 \times 10^{5}) \div (4 \times 10^{-3})$
Give your answer in standard form.

.....

(2)

(Total for Question 11 is 3 marks)

---

12 (a) Write 1.04×10^{5} as an ordinary number.

.....

(1)

(b) Write 0.06 in standard form.

.....

(1)

4.62×10^{8} tins of beans were sold last year.
These tins of beans cost a total of £300.3 million.

(c) Work out the average cost per tin of beans.

£.....

(2)

(Total for Question 12 is 4 marks)

13 (*a*) Write 0.005 49 in standard form.

.....

(1)

(*b*) Find the value of $(8 \times 10^3)^2$
Give your answer in standard form.

.....

(2)

(*c*) Find the value of $(7.6 \times 10^5) + (8.7 \times 10^4)$
Give your answer in standard form.

.....

(2)

(Total for Question 13 is 5 marks)

14 The distance from the Earth to the Sun is 1.496×10^{11} metres.
The speed of light is 3×10^{8} metres per second.

(a) Show that, correct to 3 significant figures, light will take 0.139 hours to travel from the Sun to the Earth.

(3)

1 googol is 1×10^{100}

Danesh says,

> When I multiply 1.496×10^{11} by 6.68×10^{9}
> I get nearly 1 googol because $1.496 \times 10^{11} \times 6.68 \times 10^{9} = 9.99 \times 10^{99}$

Is Danesh correct?

(b) Give a reason for your answer.

.....

.....

(1)

(Total for Question 14 is 4 marks)

TOTAL FOR THIS PAPER: 42