

1MA1 Higher themed papers: Indices

Write your name here			
Surname	Other names		
Centre Number		Candidate Number	
Pearson Edexcel Level 1/Level 2 GCSE (9–1)			
Mathematics Indices			
			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 **43**. 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 $\frac{3^5 \times 3^4}{3^2}$ as a power of 3

.....
(2)

(b) Write down the value of 12^0

.....
(1)

(c) Write down the value of 3^{-2}

.....
(1)

(Total for Question 1 is 4 marks)

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2

(a) Simplify $(p^2)^5$

.....
(1)

(b) Simplify $12x^7y^3 \div 6x^3y$

.....
(2)

(Total for Question 2 is 3 marks)

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3

(a) Write down the value of $36^{\frac{1}{2}}$

.....
(1)

(b) Write down the value of 23^0

.....
(1)

(c) Work out the value of $27^{-\frac{2}{3}}$

.....
(2)

(Total for Question 3 is 4 marks)

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4 (a) Find the value of $81^{\frac{1}{2}}$

.....
(2)

(b) Find the value of $\left(\frac{64}{125}\right)^{\frac{2}{3}}$

.....
(2)

(Total for Question 4 is 4 marks)

5 (a) Simplify $m^3 \times m^4$

.....
(1)

(b) Simplify $(5np^3)^3$

.....
(2)

(c) Simplify $\frac{32q^9r^4}{4q^3r}$

.....
(2)

(Total for Question 5 is 5 marks)

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6 Work out the value of $\frac{3^7 \times 3^{-2}}{3^3}$

.....
(Total for Question 6 is 2 marks)

7 Patrick has to work out the exact value of $64^{\frac{1}{4}}$
Patrick says,

“ $\frac{1}{4}$ of 64 is 16 so $64^{\frac{1}{4}} = 16$ ”

Explain what is wrong with what Patrick says.

.....
.....
.....
(Total for Question 7 is 1 mark)



8 (a) Write down the value of $100^{\frac{1}{2}}$

.....
(1)

(b) Find the value of $125^{\frac{2}{3}}$

.....
(2)

(Total for Question 8 is 3 marks)

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9 (a) Write down the value of 25^0

.....
(1)

(b) Find the value of $49^{-\frac{1}{2}}$

.....
(2)

(c) Find the value of $64^{\frac{2}{3}}$

.....
(2)
(Total for Question 9 is 5 marks)

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10 (a) Find the value of $\sqrt[4]{27 \times 3 \times 10^8}$

.....
(2)

(b) Find the value of $\left(\frac{216}{1000}\right)^{-\frac{2}{3}}$

.....
(2)

(Total for Question 10 is 4 marks)

11 $16^{\frac{1}{5}} \times 2^x = 8^{\frac{3}{4}}$

Work out the exact value of x .

.....
(Total for Question 11 is 3 marks)

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- 12** Given that $9^{-\frac{1}{2}} = 27^{\frac{1}{4}} \div 3^{x+1}$
find the exact value of x .

$x = \dots\dots\dots$

(Total for Question 12 is 3 marks)

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13 (a) Work out the value of $\left(\frac{16}{81}\right)^{\frac{3}{4}}$

.....
(2)

$$3^a = \frac{1}{9} \quad 3^b = 9\sqrt{3} \quad 3^c = \frac{1}{\sqrt{3}}$$

(b) Work out the value of $a + b + c$

.....
(2)

(Total for Question 13 is 4 marks)

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14 Given that $3^{-n} = 0.2$

find the value of $(3^4)^n$

.....
(Total for Question 14 is 2 marks)

TOTAL MARKS FOR PAPER: 43