Name	Class

MATHS TEACHER HUB

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Powers and roots

(9 – 1) Topic booklet

Model Answers

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

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.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

Information

- 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.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

1 Work out the value of 2^4

$2 \times 2 \times 2 \times 2$

$= 16$

.....

June 2017 – Paper 1F **(Total for Question 1 is 1 mark)**

2 Work out 3^2

$= 3 \times 3$

$= 9$

.....

November 2022 – 1F **(Total for Question 2 is 1 mark)**

3 Find $\sqrt{1.44}$ $= 1.2$

.....

November 2018 – Paper 3F **(Total for Question 3 is 1 mark)**

3 Work out the value of 3^5

$3 \times 3 \times 3 \times 3 \times 3$

$= 243$

.....

May 2018 – Paper 2F **(Total for Question 3 is 1 mark)**

3 Here is a list of numbers

4 7 9 25 27 31 64

From the numbers in the list, write down a cube number.

$= 3 \times 3 \times 3$

Sample 1 – Paper 2F **(Total for Question 3 is 1 mark)**

4 Work out 2.5^2 $25 \times 25 = 625$

$\therefore \quad 2.5^2 = 6.25$

May 2020 – Paper 3F **(Total for Question 4 is 1 mark)**

4 Here is a list of numbers. 3^2 3^3

4 6 9 10 15 27 30 40

From the list, write down all the numbers that are powers of 3

9 27

June 2019 – Paper 3F **(Total for Question 4 is 1 mark)**

4 Find the value of 5^4 $5 \times 5 \times 5 \times 5$

$= 625$

Specimen 2 – Paper 2F **(Total for Question 4 is 1 mark)**

4 Work out the cube root of 64

$\sqrt[3]{64} = 4$

.....

November 2018 – Paper 2F **(Total for Question 4 is 1 mark)**

4 Find the value of $\sqrt{17.64}$ $= 4.2$.

.....

November 2019 – Paper 2F **(Total for Question 4 is 1 mark)**

5 Write down the value of 7^2

$= 7 \times 7$

$= 49$.

.....

November 2021 – Paper 1F **(Total for Question 5 is 1 mark)**

5 Work out 2^3

$2 \times 2 \times 2$

$= 8$

.....

(1)

November 2018 – Paper 1F **(Total for Question 5 is 1 mark)**

5 Here is a list of numbers.

3 4 9 18 27 30 36

From the numbers in the list, write down a cube number.

$3^3 = 27$

.....

May 2020 – Paper 2F **(Total for Question 5 is 1 mark)**

5 Find the value of 6^5

$6 \times 6 \times 6 \times 6 \times 6$

7776.

.....

November 2019 – Paper 2F **(Total for Question 5 is 1 mark)**

5 Find $\sqrt{1.69}$ = 1.3

.....

June 2022 – Paper 3F **(Total for Question 5 is 1 mark)**

6 Here is a list of whole numbers from 21 to 30

21 22 23 24 25 26 27 28 29 30

(a) From the list, write down a square number.

25

(1)

(b) From the list, write down a multiple of 8

24

(1)

November 2021 – Paper 1F **(Total for Question 6 is 2 marks)**

8 Here is a list of numbers.

21 22 23 24 25 26 27 28 29

(a) From the numbers in the list, write down a square number.

25

(1)

June 2017 – Paper 2F **(Total for Question 8 is 1 mark)**

9 Nidah writes down two different prime numbers.

She adds together her two numbers.
Her answer is a square number less than 30

Find two prime numbers that Nidah could have written down.

Sq nos
36 - 30 = 6
49 - 30 = 19
64 - 30 = 34

19 = 2 + 17

..... , ...

November 2017 – Paper 3F **(Total for Question 9 is 2 marks)**

11 Work out 4^4

$= 4 \times 4 \times 4 \times 4$

$= 256$.

.....

(1)

Specimen 1 – Paper 3F **(Total for Question 11 is 1 mark)**

15 (a) Write down the value of $\sqrt{64}$

$= 8$

.....

(1)

(b) Work out the value of 5^3

$= 125$

.....

(1)

June 2019 – Paper 1F

(Total for Question 15 is 2 marks)

22 Write down the value of 2^{-3}

$\frac{1}{2^3} = \frac{1}{8}$

.....

(1)

November 2017 – Paper 1F

(Total for Question 22 is 1 mark)