Name	Date

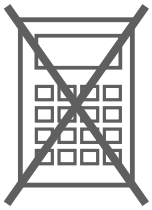
GCSE Mathematics 9-1

Powers and Roots

(Non-Calculator)

Exam-Style Topic Paper	Total Marks
Time: 1 hour 10 minutes	**/ 62**

Instructions



- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name and date 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 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.
- Try to answer every question.
- Check your answers if you have time at the end.

1 Here is a list of numbers.
From the list, write down a square number.

4 6 9 12 15

.....

[1 mark]

---

2 Here is a list of numbers.
From the list, write down the square number.

10 16 18 20 24

.....

[1 mark]

---

3 Here is a list of numbers.
Circle all the square numbers.

1 8 25 36 40 49 50

[2 marks]

---

4 Here is a list of numbers.
From the list, write down the two cube numbers.

6 8 12 18 27

.....

[2 marks]

---

5 Write down the first five square numbers.

.....

[1 mark]

---

6 Write down the first four cube numbers.

.....

[1 mark]

---

7 Here is a list of numbers.

9 27 36 64 100

(a) From the list, write down a number that is a square number but not a cube number.

.....

[1 mark]

(b) From the list, write down the number that is a cube number but not a square number.

.....

[1 mark]

(c) From the list, write down the number that is both a square number and a cube number.

.....

[1 mark]

---

8 Write down the value of

(a) 6^2

.....

[1 mark]

(b) 9^2

.....

[1 mark]

(c) 11^2

.....

[1 mark]

(d) 1^2

.....

[1 mark]

---

9 Write down the value of

(a) 3 squared

.....

[1 mark]

(b) 10 squared

.....

[1 mark]

(c) 12 squared

.....

[1 mark]

---

10 Work out 20^2

.....

[1 mark]

---

11 Work out $5^2 + 3^2$

.....

[2 marks]

---

12 Work out $8^2 - 4^2$

.....

[2 marks]

---

13 Work out $2^2 \times 3^2$

.....

[2 marks]

---

14 Write down the value of

(a) $\sqrt{49}$

.....

[1 mark]

(b) $\sqrt{100}$

.....

[1 mark]

(c) $\sqrt{1}$

.....

[1 mark]

(d) $\sqrt{144}$

.....

[1 mark]

---

15 Write down the value of

(a) $\sqrt{16}$

.....

[1 mark]

(b) $\sqrt{81}$

.....

[1 mark]

(c) $\sqrt{121}$

.....

[1 mark]

---

16 Write down the value of

(a) $\sqrt[3]{8}$

.....

[1 mark]

(b) $\sqrt[3]{27}$

.....

[1 mark]

(c) $\sqrt[3]{1000}$

.....

[1 mark]

---

17 Work out $\sqrt{36} + \sqrt{64}$

.....

[2 marks]

---

18 Work out $\sqrt{25} \times \sqrt{4}$

.....

[2 marks]

---

19 Work out $\sqrt{100} - \sqrt{9}$

.....

[2 marks]

---

20 Fill in the missing number.

$\ldots\ldots^2 = 49$

[1 mark]

---

21 Fill in the missing number.

$$\sqrt{} = 6$$

[1 mark]

22 Fill in the missing number.

$$\text{.....}^2 = 144$$

[1 mark]

23 Write these in order, starting with the smallest.

3^2 $\sqrt{64}$ 2^2 $\sqrt{100}$

.....

[2 marks]

24 Which is bigger, 4^2 or $\sqrt{400}$?
You must show your working.

.....

[2 marks]

25 Is 50 a square number?
Explain your answer.

.....

.....

[1 mark]

26 Jo says, "$3^2 = 6$"
Is Jo correct?
Explain your answer.

.....

.....

[1 mark]

---

27 I am thinking of a square number.
It is between 50 and 70.
What is my number?

.....

[1 mark]

---

28 I am thinking of an odd square number.
It is between 20 and 40.
What is my number?

.....

[1 mark]

---

29 Amir is thinking of two numbers.
Both numbers are square numbers greater than 10.
The two numbers add together to make 61.
What are Amir's two numbers?

.....

[2 marks]

---

30 Holly is thinking of two numbers.
Both numbers are cube numbers.
The two numbers add together to make 35.
What are Holly's two numbers?

.....

[2 marks]

---

31 A square patio is made from square tiles.
There are 8 tiles along each side of the patio.
How many tiles are there altogether?

..... tiles

[2 marks]

---

32 A square garden has an area of 81 m^2.
How long is each side of the garden?

..... m

[2 marks]

---

33 Sam thinks of a number.
He squares his number and then adds 5
His answer is 41
What number did Sam think of?

.....

[2 marks]