

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Number

Calculating with roots and powers (calculator)

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments
- You may use a calculator



Information

- The marks for questions are shown in brackets

Advice

- In all calculations, show clearly how you work out your answer

Questions 1 to 28 are **foundation** tier only

Q1.

Show that there are **exactly** five 3-digit cube numbers.

(Total 3 marks)

Q2.

Complete the boxes using
a square number
and
a prime number.

$$\square \div \square = 18$$

(Total 2 marks)

Q3.

What is 625 as a power of 5?
Circle your answer.

5^3

5^4

5^5

5^{125}

(Total 1 mark)

Q4.

Circle the cube number.

3

8

9

16

(Total 1 mark)

Q5.

Use your calculator to work out

(a) $\sqrt{576}$

(1)

(b) $2.3^2 + \sqrt{5}$

(1)

(c) $\frac{1}{0.4^2}$

(1)

(Total 3 marks)

Q6.

Use your calculator to work out 13×24^2

(Total 1 mark)

Q7.

(a) Work out $\sqrt{1.96}$

(1)

(b) Work out $\frac{10.6 - 7.45}{2.5}$

(1)

(Total 2 marks)

Q8.

- (a) Work out the value of 7^3

(1)

- (b) The sum of two consecutive cube numbers is 341.
Work out the two numbers.

(2)

(Total 3 marks)

Q9.

Circle the cube number.

9

10 000

333

729

(Total 1 mark)

Q10.

Work out 81 as a power of 3

Circle your answer.

3^3

3^4

3^5

3^6

(Total 1 mark)

Q11.

Write down an even whole number that is also a square number.

(Total 1 mark)

Q12.

Work out the square root of 100 million.

Circle your answer.

1000

10 000

100 000

1 000 000

(Total 1 mark)

Q13.

Which of these is a cube number?

Circle your answer.

3

9

27

100

(Total 1 mark)

Q14.

Solve $x^2 = 196$

(Total 2 marks)

Q15.

- (a) Work out $\sqrt[3]{4096}$

(1)

- (b) Work out 3^7

(1)

(Total 2 marks)

Q16.

Circle the number that is one **less** than a cube number.

20

22

24

26

(Total 1 mark)

Q17.

The first two cube numbers are 1 and 8

Show that

the 3rd cube number can be written as the sum of three different prime numbers.

$$\boxed{} = \boxed{} + \boxed{} + \boxed{}$$

(Total 3 marks)

Q18.

Circle the value of 2^5

10

25

32

64

(Total 1 mark)

Q19.

Write down **all** the cube numbers between 100 and 400

(Total 2 marks)

Q20.

Which of these numbers is three less than a square number?

Circle your answer.

5

19

22

34

(Total 1 mark)

Q21.

Which two numbers, when added together, make a cube number?

Circle your answer.

1 and 8

2 and 4

9 and 18

8 and 64

(Total 1 mark)

Q22.

(a) Work out

$$\frac{2}{7} \times 3$$

(1)

(b) Work out

$$\sqrt{529}$$

(1)

(c) Work out

$$3^4$$

(1)

(Total 3 marks)

Q23.

The square root of x is 4

Circle the value of x^2

256

2

16

8

(Total 1 mark)

Q24.

Write down **one** cube number between 100 and 300

(Total 1 mark)

Q25.

Work out the value of 19^2

(Total 1 mark)

Q26.

Work out the value of 3^2

(Total 1 mark)

Q27.

I am thinking of a prime number.

Its digits add up to a square number.

Write down a prime number that I could be thinking of.

(Total 2 marks)

Q28.

I am thinking of a number.

It has two digits.

It is 3 more than a number that is **both** a square and a cube number.

Is the number I am thinking of a prime number?

Tick a box.

☐

Prime

☐

Not prime

You **must** show working to support your answer.

(Total 2 marks)

Questions 29 to 32 are **higher** tier only

Q29.

Which of these values of n makes 2.7×10^n a cube number? Circle your answer.

0

1

2

3

(Total 1 mark)

Q30.

b and c are **different** prime numbers between 15 and 30. a is an integer. $a = \sqrt{4b + c}$

Work out a possible set of values for a , b and c

(Total 3 marks)

Q31.

$2^x = 32$. Circle the value of x .

4

5

6

7

(Total 1 mark)

Q32.

Solve $x^2 = 12.25$

(Total 2 marks)