

Name: _____

GCSE (1 – 9)

Fractional and Negative Indices

Instructions

- Use **black** ink or ball-point pen.
- 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.**

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

1 Find the value of 3^{-1}

.....
(Total for question 1 is 1 mark)

2 Find the value of $\left(\frac{4}{5}\right)^{-1}$

.....
(Total for question 2 is 1 mark)

3 Find the value of 5^{-1}

.....
(Total for question 3 is 1 mark)

4 Find the reciprocal of 3

.....
(Total for question 4 is 1 mark)

5 Find the value of $100^{\frac{1}{2}}$

.....
(Total for question 5 is 1 mark)

6 Find the value of $64^{\frac{1}{2}}$

.....
(Total for question 6 is 1 mark)

7 Find the value of $49^{\frac{1}{2}}$

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

8 Find the value of $81^{\frac{1}{2}}$

.....
(Total for question 8 is 1 mark)

9 Find the value of $36^{-\frac{1}{2}}$

.....
(Total for question 9 is 1 mark)

10 Find the value of $64^{\frac{1}{3}}$

.....
(Total for question 10 is 1 mark)

11 Find the value of $8^{\frac{1}{3}}$

.....
(Total for question 11 is 1 mark)

12 Find the value of $27^{\frac{1}{3}}$

.....
(Total for question 12 is 1 mark)

13 Find the value of $125^{\frac{1}{3}}$

.....
(Total for question 13 is 1 mark)

14 Find the value of $64^{-\frac{1}{3}}$

.....
(Total for question 14 is 1 mark)

15 Find the value of $64^{-\frac{2}{3}}$

.....
(Total for question 15 is 2 marks)

16 Find the value of $125^{\frac{2}{3}}$

.....
(Total for question 16 is 2 marks)

17 Find the value of $8^{-\frac{2}{3}}$

.....
(Total for question 17 is 2 marks)

18 Find the value of $27^{-\frac{2}{3}}$

.....
(Total for question 18 is 2 marks)

19 Find the value of $(8x^6)^{\frac{2}{3}}$

.....
(Total for question 19 is 2 marks)

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

.....
(Total for question 20 is 2 marks)

21 Find the value of $\left(\frac{25}{16}\right)^{-\frac{3}{2}}$

.....
(Total for question 21 is 2 marks)

22 Find the value of $\left(\frac{8}{27}\right)^{-\frac{2}{3}}$

.....
(Total for question 22 is 2 marks)

23 Find the value of $\left(\frac{9}{4}\right)^{-\frac{3}{2}}$

.....
(Total for question 23 is 2 marks)

24 Find the value of $\sqrt[4]{2 \times 8 \times 10^{12}}$

.....
(Total for question 24 is 2 marks)

25 Find the value of $\sqrt[3]{4 \times 16 \times 10^{15}}$

.....
(Total for question 25 is 2 marks)

26 Given that $3 \times \sqrt{3} = 3^n$
Find the value n .

.....
(Total for question 26 is 2 marks)

27 Given that $3 \times \sqrt{27} = 3^n$
Find the value n .

.....
(Total for question 27 is 2 marks)

28 Given that $x = 2^p$ and $y = 2^q$
Express in terms of x and/or y ,

(i) 2^{p+q}

(ii) 2^{2p}

(iii) 2^{q-1}

.....
(Total for question 28 is 3 marks)

- 29** Given that $3^{-n} = 0.2$
Find the value of $(3^n)^2$

.....
(Total for question 29 is 2 marks)

- 30** Given that $5^{-n} = 0.5$
Find the value of $(5^n)^3$

.....
(Total for question 30 is 2 marks)

- 31** Given that $4^n = 8$
Find the value of n .

.....
(Total for question 31 is 2 marks)

- 32** Given that $4^{-n} = 32$
Find the value of n .

.....
(Total for question 32 is 2 marks)
