



Maths-it Podcast H-01

Higher GCSE Revision

Factors, powers, primes and roots

Topics

Factors and multiples – Identifying primes – Finding prime factors – LCM/HCF – Rules of indices (inc roots) – Surds

Questions

1. Using the information that

$$13 \times 23 = 299$$

(a) write down the value of

(i) 0.13×2.3

.....

(ii) $299 \div 0.023$

.....

(2)

(b) find the Lowest Common Multiple of 26 and 23.

.....

(2)

(Total 4 marks)

2. (a) Express 140 as the product of powers of its prime factors.

.....

(3)

(b) Find the Lowest Common Multiple of 140 and 210.

.....

(2)

(Total 5 marks)



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3. Work out

(a) (i) 12^0

.....

(ii) 2^{-4}

.....

(iii) $64^{\frac{1}{3}}$

.....

(iv) $1000^{\frac{4}{3}}$

.....

(v) $\left(\frac{16}{81}\right)^{-\frac{3}{4}}$

.....

(6)

(b) (i) Rationalise the denominator of $\frac{20}{\sqrt{5}}$ and simplify your answer.

.....

(ii) Expand $(\sqrt{7} - 2\sqrt{2})(\sqrt{7} + 2\sqrt{2})$
Express your answer as simply as possible.

.....

(4)

(c) $8 \times \sqrt{32} = 2^n$
Find the value of n .

$n = \dots\dots\dots$

(2)

(Total 6 marks)



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4. (a) Write down the value of $25^{\frac{1}{2}}$

.....

(1)

(b) $5n^{\frac{2}{3}} = 125^{-\frac{1}{3}}$

Find the value of n .

$n = \dots\dots\dots$

(3)

(Total 4 marks)

5. (a) Write as a power of 7

(i) $7^2 \times 7^9$

.....

(ii) $7^{11} \div 7^4$

.....

(2)

(b) $3^x \times 3^y = 3^{12}$

and

$3^x \div 3^y = 3^{-6}$

Work out the value of x and the value of y .

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(3)

(c) Given that $x = 4^k$ and $\sqrt{\frac{4}{x}} = 2^c$, find c in terms of k .

$c = \dots\dots\dots$

(2)

(Total 7 marks)



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6.

$$x = 5^p, \quad y = 5^q$$

(a) Express in terms of x and/or y ,

(i) 5^{p+q}

.....

(ii) 5^{-2q}

.....

(iii) 5^{p-2}

.....

(3)

$$xy = 5$$

and

$$x^2y = 625$$

(b) Find the value of p and the value of q .

$$p = \dots\dots\dots$$

$$q = \dots\dots\dots$$

(2)

(Total 5 marks)

7. The number 48 can be written as $2^p \times q$, where p is an integer and q is a prime number.

Find the value of p and the value of q .

$$p = \dots\dots\dots$$

$$q = \dots\dots\dots$$

(Total 2 marks)