

Indices

1 What number is half of 4^{2025} ?

2 $4^6 \times 64^3 \times 128^2 \div 32^6$

3 $\frac{16^5 \times 16^8 \times 16^{11}}{32^2 \times 8^6} = 4^p$ Find the value of p.

4 Solve $m^{\frac{3}{2}} = 8$

5 Express as a single power of x: $\sqrt{\frac{x^{\frac{3}{2}} \times x^{\frac{1}{2}}}{(x^2)^3}}$

6 $\frac{(x^3 \times x^w)^5}{x^6 \times x^4 \times x^8} = x^{10}$ Find the value of w.

7 $x^3 \sqrt{x^{12} \div x^3} = x^g$ Find the value of g.

8 A Fibonacci type sequence is shown below.

$$2a+b \quad 2a+b \quad 4a+2b \quad 6a+3b \quad 10a+5b$$

If $a = 3^n + 1$ and $b = 7^n - 4^n$, what is the value of the eighth term in the sequence.

9 n is an integer.

Between values of $3 < n < 12$, is $2^n - 1$ always prime?

10 For what value of x is $64^x = 512^5$?

11 Simplify fully $\left(\frac{3mn^2 \times 5m^{\frac{1}{2}} \times 4n}{30m^{\frac{5}{2}}} \right)^4$

12 The sum of two numbers is 90 and they differ by four. What is their product squared?