

Indices

1. Find the value of n in each of the following:

(a) $3^4 \times 3^3 = 3^n$

(b) $2^3 \times 2^5 = 2^n$

(c) $5^4 \times 5 = 5^n$

(d) $6^4 \times 6^{-2} = 6^n$

(e) $\frac{2^8}{2^4} = 2^n$

(f) $\frac{5^7}{5^3} = 5^n$

(g) $\frac{3^2}{3^5} = 3^n$

(h) $\frac{2^4}{2} = 2^n$

(i) $\frac{3}{3^4} = 3^n$

(j) $(3^3)^2 = 3^n$

(k) $(2^5)^3 = 2^n$

(l) $(5^3)^6 = 5^n$

(m) $(6^4)^{-3} = 6^n$

(n) $\frac{1}{2^5} = 2^n$

(o) $\frac{1}{5^3} = 5^n$

(p) $\frac{1}{3^4} = 3^n$

(q) $\frac{1}{4} = 4^n$

(r) $\sqrt{2} = 2^n$

(s) $\sqrt{5} = 5^n$

(t) $(\sqrt{3})^3 = 3^n$

(u) $(\sqrt{5})^4 = 5^n$

(v) $\frac{2^3}{\sqrt{2}} = 2^n$

$$(w) \frac{1}{\sqrt{3}} = 3^n$$

$$(x) 5^3 \times \sqrt{5} = 5^n$$

$$(y) \frac{\sqrt{7}}{7^2} = 7^n$$

$$(z) (\sqrt{2})^3 \times 2^5 = 2^n$$

Express each of the following in the form a^n where a is a prime number

2. 8

3. 9

4. 25

5. 27

6. 16

7. 81

8. 125

9. 128

10. $\frac{1}{9}$

11. $\frac{1}{8}$

12. $\frac{1}{27}$

13. $\sqrt{8}$

14. $\sqrt{27}$

15. $\sqrt{32}$

16. $\sqrt{125}$

Solve the following exponential equations.

1. $2^x = 2^4$

2. $3^{2x} = 3^6$

3. $5^{2x-1} = 5^5$

4. $7^{x+1} = 7^4$

5. $2^x = 8$

6. $3^x = 81$
7. $5^{x+1} = 25$
8. $2^{2x-1} = 16$
9. $9^x = 27$
10. $4^x = 32$
11. $25^{x+1} = 125$
12. $8^{x-1} = 32$
13. $27^{2x-3} = 81$
14. $2^x = \frac{1}{8}$
15. $3^{x+1} = \frac{1}{81}$
16. $25^x = \frac{1}{125}$
17. $9^{x-2} = \frac{1}{27}$
18. $2^x = \sqrt{2}$
19. $5^{x+1} = \sqrt{5}$
20. $9^x = \sqrt{3}$
21. $7^x = \frac{1}{\sqrt{7}}$