

Sheet 6H Indices 1



1. Write the following as powers of 3:

(a) $3^5 \times 3^4 =$

(b) $3^2 \times 3^{11} =$

(c) $3^{15} \div 3^7 =$

(d) $3^{11} \div 3^8 =$

(e) $(3^4)^3 =$

(f) $(3^2)^5 =$

(g) $(3^2)^7 \div (3^3)^2 =$

(h) $(3^5)^6 \div (3^4)^5 =$

2. Simplify the following:

(a) $a^2 \times a^3 =$

(b) $b^3 \times b^{14} =$

(c) $x^a \div x^b =$

(d) $y^{2a} \div y^a =$

(e) $(w^2)^6 =$

(f) $(q^3)^4 =$

(g) $(r^a)^b =$

(h) $\frac{t^2 \times t^5}{t^3} =$

3. Write the following without brackets:

(a) $(a^2b^3)^5 =$

(b) $(x^3y^4)^7 =$

(c) $(3p^7q^8)^2 =$

(d) $(5m^8n^4)^3 =$

(e) $(2r^5s^6)^4 =$

(f) $(5c^2d^5)^4 =$

4. Write $\frac{3^4 \times 9^3}{27^2}$ as a power of 3.

Answer =

5. Write $\frac{2^5 \times 8^7}{16^4}$ as a power of 2.

Answer =

6. Write $\frac{5^4 \times 25^6}{125^2}$ as a power of 5.

Answer =

7. Find x in the following:

(a) $4^x = 64, \quad x =$

(b) $3^x = 243, \quad x =$

(c) $2^x = 16, \quad x =$

(d) $2^x = \frac{1}{32}, \quad x =$

(e) $5^x = 625, \quad x =$

(f) $10^x = 1 \text{ million}, \quad x =$

(g) $7^x = 1, \quad x =$

(h) $2^x = \sqrt{2}, \quad x =$

(i) $3^x = 3\sqrt{3}, \quad x =$

8. Find n in the following :

(a) $2^{3n-1} = 4, \quad n =$

(b) $3^{n+1} = 81, \quad n =$

(c) $7^{-n} = 49, \quad n =$

(d) $\left(\frac{1}{2}\right)^{3n} = 64, \quad n =$

(e) $10^{2n+1} = 100000, \quad n =$

(f) $5^{3n-7} = 25, \quad n =$

(g) $2^{5-n} = 64, \quad n =$

(h) $3^{2n-1} = 27, \quad n =$