

# Indices

## Practice Questions

Evaluate the following expressions (without your calculator).

1.  $10^6 \div 10^4$
2.  $2^8 \div 2$
3.  $4^0$
4.  $10^0$
5.  $3 \times 5^0$
6.  $10^{-3}$
7.  $8^{-1}$
8.  $3^{-3}$
9.  $49^{1/2}$
10.  $8^{2/3}$
11.  $25^{3/2}$
12.  $32^{3/5}$
13.  $(2^3)^2$
14.  $(3^4)^{1/4}$

Simplify the following expressions.

15.  $m^5 \times m^3$
16.  $x \times x^2$
17.  $x^4 \times x^2$
18.  $y^2 \times y^b$
19.  $a^m \times a^n$
20.  $x^9 \div x^2$
21.  $t^4 \div t^2$
22.  $x^7 \div x^{-2}$
23.  $x^0$
24.  $(ax)^0$
25.  $a \times b^0$
26.  $x + y^0$
27.  $(x^3)^4$
28.  $(a^2b^4)^4$
29.  $(p^{-1}q^5)^{-1}$
30.  $(a^{1/2})^3$

Rewrite the following expressions using only positive indices.

31.  $\left(\frac{1}{x}\right)^{-1}$
32.  $y^{-3}$

Simplify the following expressions.

33.  $2^n \times 2^{2n} \times 2^{3n}$
34.  $a^3 \times a^5 \times a^{-2}$
35.  $x^2 \times x^4 \times x^3$
36.  $(p^2q)^4 \times (q^2p)^5$
37.  $a^3b^{-2} \times (a^2b^2)^4$

Rewrite the following expressions using only positive indices.

38.  $(a^2)^0 \times (a^{1/2})^4$
39.  $\frac{(2x)^{-3}}{x^3}$
40.  $\frac{2a^2b^{-2}}{2^{-3}b^{-4}}$
41.  $\frac{x^{-1} + y^{-1}}{x + y}$
42.  $\frac{10^n - 4^n}{5^n - 2^n}$

Simplify the following expressions.

43.  $\frac{(2m^2n)^3}{(mn^3)^2 \times (4m^2)^2}$
44.  $\frac{5x^5y^2 \times 3(xy^3)^2}{15x^2y}$

Find the values of  $x$  that make the following equations hold.

45.  $3^x = 81$
46.  $2^x = 8$
47.  $x^{-2} = 9$
48.  $x^3 = -125$
49.  $4^x = 32$
50.  $9 \times 3^{x-1} = \frac{1}{27}$