

Powers

Evaluate:

a) $7^2 = 49$

b) $1^{12} = 1$

c) $2^5 = 32$

d) $13^0 = 1$

e) $3^4 = 81$

Roots

Work out the value of:

a) $\sqrt{25} = 5$

b) $\sqrt[3]{8} = 2$

c) $\sqrt[3]{-27} = -3$

d) $\sqrt[4]{10000} = 10$

e) $\sqrt{\frac{1}{16}} = \frac{1}{4}$

Working with indices

Indices and products

a) $a^3 \times a^2 = a^5$

b) $t^5 \times t \times t^3 = t^9$

c) $g^5 \times g^{-2} = g^3$

d) $h \times h^{-4} \times h^3 = 1$

e) $f^{-4} \times d^3 = d^3 f^{-4}$ or $\frac{d^3}{f^4}$

Indices and division

a) $p^7 \div p^2 = p^5$

b) $w^{-3} \div w^{-5} = w^2$

c) $u^2 \div u^3 = u^{-1}$

d) $q^2 \div q^{-8} = q^{10}$

e) $3 \div r^{-2} = 3r^2$

Indices and brackets

a) $(r^3)^2 = r^6$

b) $(x^4)^{-3} = x^{-12}$

c) $(3j^2)^3 = 27j^6$

d) $5(h^2)^{-4} = 5h^{-8}$

Negative indices

Write as a fraction in simplest form:

a) $5^{-1} = \frac{1}{5}$

b) $3^{-2} = \frac{1}{9}$

c) $2^{-4} = \frac{1}{16}$

Write in the form x^{-n} :

d) $\frac{1}{7} = 7^{-1}$

e) $\frac{1}{1000} = 10^{-3} \quad (n \neq 1)$

f) $\frac{1}{25} = 5^{-2} \quad (n \neq 1)$

Indices and algebraic fractions

Simplify fully:

a) $\frac{r^7}{r^3} = r^4$

b) $\frac{e^3 \times e^7}{e^6} = e^4$

Simplify by writing in the form $c^n g^m$
where n and m are integers:

c) $\frac{c^4 \times g^2 \times g^5 \times c^3}{c^2 \times g^8} = c^5 g^{-1}$

Further simplification

Simplify fully:

a) $3a^2 b^5 \times 4a^3 b^6 = 12a^5 b^{11}$

b) $5d^{-3} e \times 2d^4 e^{-3} = 10de^{-2}$

c) $\frac{3w^8}{15w^2} = \frac{w^6}{5}$

d) $\frac{2g^3 h \times 9g^2 h^5}{6g^5 h^2} = 3h^4$

Calculations with bracketsEvaluate, leaving your answer as
a fraction when necessary:

a) $(-2)^3 = -8$

b) $\left(\frac{3}{4}\right)^3 = \frac{27}{64}$

c) $\left(\frac{2}{3}\right)^{-4} = \frac{81}{16}$

Rewrite as a fraction in its simplest
form:

d) $\left(\frac{a^2}{b^3}\right)^{-2} = \frac{b^6}{a^4} \quad (a \neq b)$