

Ex 21 Indices

1. Find the value of the following:

(a) 2^5 (b) 3^{-2} (c) $9^{\frac{1}{2}}$ (d) 3^{-3}
(e) 5^0 (f) $8^{\frac{2}{3}}$ (g) $9^{\frac{3}{2}}$ (h) 7^{-1}

2. Simplify each of the following:

(a) $a^4 \times a^{-3} \times a^{-1}$ (b) $\left(x^{\frac{1}{2}}\right)^6$ (c) $\frac{y^3 \times y^{-2}}{y^{-3}}$ (d) $(g^{-2})^{-4}$

3. Simplify the following:

(a) $3t^3 \times 5t^4$ (b) $4m^6 \div 2m^2$ (c) $3y^2 \times 4y \times 5y$
(d) $\frac{k^2 \times k^4}{k^5}$ (e) $(f^3)^5$ (f) $(2c^{\frac{1}{2}}d^{\frac{1}{3}})^{-2}$

4. Express each of the following using positive indices:

(a) $6d^5 \times 3d^3$ (b) $\frac{q^3 q^2}{q^{10}}$ (c) $\frac{7u^{\frac{1}{8}}}{6u^{\frac{1}{9}}}$ (d) $\frac{3j^4}{j^{\frac{1}{5}} \times j^{\frac{2}{5}}}$

5. The cost of hiring a carpet cleaner, £ C , is $C = f + 5h$ where f is the fixed cost and h is the number of hours hired.

Make h the subject of the formula.

6. The volume of a cylinder is given by the formula: $V = \pi r^2 h$

(a) Change the subject of the formula to r .

(b) Calculate the radius of a 25 centimetre tall cylinder with a volume of $1\frac{1}{4}$ litres.