

LAWS OF INDICES

Task 1 – Fully simplify the following

- 1) $x^2 \times x^4 = x^6$
- 2) $s^3 \times s^2 = s^5$
- 3) $u^8 \times u^{-3} = u^5$
- 4) $5y^7 \times 10y^8 = 50y^{15}$
- 5) $3z^6 \times 7z^3 = 21z^9$
- 6) $7p^{-8} \times 4p^5 = 28p^{-3} = \frac{28}{p^3}$
- 7) $2a^2b \times 4a^3b^4 = 8a^5b^5$
- 8) $3a^4b \times 2a^2b^3 = 6a^6b^4$
- 9) $5x^3y^2 \times 2x^4y = 10x^7y^3$
- 10) $y^7 \div y^8 = y^{-1} = \frac{1}{y}$
- 11) $\frac{y^5}{y^9} = y^{-4} = \frac{1}{y^4}$
- 12) $\frac{z^9}{z^4} = z^5$
- 13) $\frac{12a^6}{3a^2} = 4a^4$
- 14) $\frac{10b^4}{5b^2} = 2b^2$
- 15) $20m^2n^7 \div 5mn^5 = 4mn^2$
- 16) $\frac{6n^5}{2n^3} = 3n^2$
- 17) $\frac{30p^3q^5}{10p^2q^4} = 3pq$
- 18) $\frac{10r^4s^6}{40r^2s^2} = \frac{r^2s^4}{4}$
- 19) $(a^2)^6 = a^{12}$
- 20) $(b^4)^3 = b^{12}$
- 21) $(5k^4)^2 = 25k^8$
- 22) $(3u^2)^4 = 81u^8$
- 23) $(4w^2)^3 = 64w^6$
- 24) $(e^2f^3)^5 = e^{10}f^{15}$
- 25) $(2c^3d^0)^4 = 16c^{12}$

Task 2

- 26) Work out the value of $5^{-3} = \frac{1}{125}$
- 27) Work out the value of $2^{-4} = \frac{1}{16}$
- 28) Work out the value of $16^0 = 1$
- 29) $\frac{1}{x^2} = x^{-a}$
Work out the value of a . $a = 2$
- 30) $\frac{1}{y^4} = y^{-b}$
Work out the value of b . $b = 4$
- 31) Write $(d^{-2})^4$ in the form $d^a = d^{-8}$
- 32) Work out the value of $r^0 \div 2 = \frac{1}{2}$
- 33) Work out the value of $10 \times 5a^0 = 50$
- 34) Write $3^2 \times 3^8$ as a single power of 3. 3^{10}
- 35) Write $\frac{4^5 \times 4^6}{4^3}$ as a single power of 4. 4^8
- 36) Write 16×8 as a single power of 2. 2^7
- 37) Write $(125)^2 \div 5$ as a single power of 5. 5^5
- 38) Write the reciprocal of $3x^{-2}$ in the form $\frac{x^a}{3}$

Challenge – Fully simplify the following

- 39) $(3x^2y^3)^2 \times (2x^3y)^3 = 72x^{13}y^9$
- 40) $\frac{(4a^{-2}b^3)^2}{(2a^{-1}b)^3} = 2a^{-1}b^3 = \frac{2b^3}{a}$
- 41) $\left(\frac{x^4y^{-2}}{x^{-1}y^3}\right)^2 = x^{10}y^{-10} = \frac{x^{10}}{y^{10}}$
- 42) $\frac{(6m^2n^{-3})^2}{(3mn^{-1})^3} = \frac{4mn^{-3}}{3} = \frac{4m}{3n^3}$
- 43) $(5a^2b^0)^3 \times (2ab)^2 = 500a^8b^2$
- 44) $(2x^3y^2)^0 \times (4x^2y)^2 = 16x^4y^2$
- 45) $\left(\frac{9p^6q^{-2}}{3p^3q}\right)^2 \times \left(\frac{p^3q^{-1}}{p^{-2}q^2}\right)^{-1} = 9p^6q^{-6} \times p^{-5}q^3 = \frac{9p}{q^3}$