

INDEX NUMBERS

Keywords:	Index / Indices / Power / Exponent / Base / Root / Reciprocal							
Definitions/ Description:	Index number / Indices (pl) - the small digit to the top right of a number that tells you the number of times that number is multiplied by itself.	Base: the number you apply the power to.			Reciprocal: the inverse of any number except 0.		Root: root of a number is a number that when multiplied by itself produces the original number	
Knowledge points:	Understand Index notation - squares, cubes and roots	Multiplication Index Law - when multiplying with the same base, ADD the powers	Division Index Law - When dividing with the same base, SUBTRACT the powers	Brackets Index Law - when raising a power to another power, MULTIPLY the powers together	Negative powers - a negative power performs the reciprocal	Fractional Powers - the denominator of a fractional power acts as a 'root' - The numerator of a fractional power acts as the normal power	Power of 0 - Anything to the power of 0 is 1	Changing the Base -
Knowledge point examples:	$3 \times 3 = 3^2 = \underline{9}$ $\sqrt{9} = \underline{\pm 3}$ $4 \times 4 \times 4 = 4^3 = \underline{64}$ $\sqrt[3]{64} = \underline{4}$	$a^4 \times a^5 = a^{4+5} = \underline{a^9}$ $5^6 \times 5^7 = \underline{5^{11}}$ $3a^4 \times 5a^6 = \underline{15a^{10}}$	$a^6 \div a^4 = a^{6-4} = \underline{a^2}$ $5^{10} \div 5^7 = \underline{5^3}$ $8a^4 \div 4a^3 = \underline{2a}$	$(a^3)^4 = a^{3 \times 4} = \underline{a^{12}}$ $(5^4)^6 = \underline{5^{24}}$ $(5a^3)^2 = \underline{25a^6}$	$a^{-1} = \frac{1}{a}$ $5^{-2} = (\frac{1}{5})^2 = \frac{1}{25}$ $(\frac{1}{4})^{-3} = 4^3 = \underline{64}$	$a^{\frac{b}{c}} = (\sqrt[c]{a})^b$ $27^{\frac{2}{3}} = (\sqrt[3]{27})^2 = 3^2 = \underline{9}$	$a^0 = \underline{1}$ $6^0 = \underline{1}$ $4a^0 = 4 \times 1 = \underline{4}$	Write as a power of 2: $16^5 = (2^4)^5 = 2^{20}$
Linked Knowledge Maps:	Standard Form / Surds / Non-Linear Graphs / Non-Linear Graphs – Quadratic and Cubic							