STANDARD FORM

Keywords:	**Standard form / Index / Integer**				
Definition / Description :	**Standard form** is a short-hand way of writing very small or very large numbers, given in the form ***a*** x 10^{n}, where *a* is a number between 1 and 10	**Index** (or power) is the small digit to the top right of a number which tells you the number of times a number is multiplied by itself		**Integer** is a whole number, either positive o negative	
Knowledge points:	**Understand correct standard index form:** Recognise the correct format for standard form as ***a*** x 10^{n}, where 1 ≤ ***a*** < 10	**Convert between ordinary numbers and standard index form:** Use place value to multiply or divide numbers by powers of 10	**Compare numbers in standard form** Use ordering decimals and indices to compare values of ***a*** and ***n***	**Add and subtract numbers in standard form** Use adjusting standard form to add/subtract	**Multiply and divide numbers in standard form:** Use laws of indices to multiply/divide
Knowledge point examples:	***a*** x 10^{n} 1 ≤ ***a*** < 10 ***n*** is an integer 0.25 x 10^{6} is **not** correct standard form (***a*** is not ≥ 1) 25.9 x 10^{8} is **not** correct standard form (***a*** is not < 10) 2.36 x $10^{0.5}$ is **not** correct standard form (***n*** is not an integer)	*Write in standard form:* 379.4 Answer must be in form ***a*** x 10^{n}, so ***a*** must be written as 3.794: 3 . 7 9 . 4 Adjust the place value twice to the right, which is the equivalent of 10 x 10 = 10^{2}: 3.794 x 10^{2} *Write as an ordinary number:* 2.65 x 10^{5} Take the value of ***a*** and multiply the value by the value of ***n***: 2 6 5 0 0 0 . 0 265,000	*Which is larger:* 1.45 x 10^{4} 1.45 x 10^{3} Compare values for ***n*** in 10^{4} and 10^{3} –> 10^{3} is smaller than 10^{4} (10^{3} = 10 x 10 x 10, 10^{4} = 10 x 10 x 10 x 10) 1.45x10^{3} < 1.45x10^{4} *Write these numbers in ascending order:* 4.5 x 10^{3} 2.3 x 10^{3} Compare values for ***a*** in 4.5 and 2.3 -> 2.3 is smaller than 4.5 Therefore: 2.3 x 10^{3}, 4.5 x 10^{3}	*Calculate:* 7 x 10^{3} + 2 x 10^{3} **Method 1**: 7 x 10^{3} = 7000 2 x 10^{3} = 2000 7000 + 2000 = 9000 9000 = 9 x 10^{3} **Method 2:** (7 + 2) x 10^{3} = 9 x 10^{3} *Calculate:* 9.6 x 10^{5} – 3.2 x 10^{4} Adjust 3.2 x 10^{4} to the same power of 10 as 9.6 x 10^{5} -> 0.32 x 10^{5} (9.6 – 0.32) x 10^{5} = 9.28 x 10^{5}	*Calculate:* (3.2 x 10^{2}) x (2 x 10^{4}) [1] Multiply values of ***a*** 3.2 x 2 = 6.4 [2] Multiply powers of 10 using law of indices: 10^{2} x 10^{4} = $10^{(2+4)}$ -> 10^{6} Combine parts [1] and [2]: 6.4 x 10^{6} *Calculate:* (2.8 x 10^{9}) ÷ (4 x 10^{5}) [1] Divide values of ***a***: 2.8 ÷ 4 = 0.7 [2] Divide powers of 1 using law of indices: 10^{9} ÷ 10^{5} = $10^{(9-5)}$ -> 10^{4} Combine parts [1] and [2] and adjust to correct standard form: 0.7 x 10^{4} -> 7 x 10^{3}
Linked	Ordering decimals / Place value / Laws of indices				