



UNIT 1F NUMBER 100% SHEET

DEFINITIONS OF KEYWORDS	INDICES	CALCULATIONS	PRIOR KNOWLEDGE																																																																									
<p>Estimating- Work out an approximate answer.</p> <p>Surds- When we cannot simplify a number to remove a square root (or cube root etc.) then it is a surd.</p> <p>Index (of a number)- Says how many times to use the number in a multiplication. It is written as a superscript i.e. $8^2 = 8 \times 8 = 64$.</p> <p>Indices- The plural of index is indices. (Other names for index are exponent or power.)</p> <p>HCF-The 'Highest Common Factor' is the greatest value that can be divided exactly into each of two or more numbers</p> <p>LCM- The 'Lowest Common Multiple' is the lowest quantity that is a multiple of two or more given quantities</p>	<p style="text-align: center; font-size: small;">Laws of Indices www.cazoommaths.com</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e0f0ff;"> <th>Rule</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>$a^m \times a^n = a^{m+n}$</td> <td>$2^5 \times 2^3 = 2^8$</td> </tr> <tr> <td>$a^m \div a^n = a^{m-n}$</td> <td>$5^7 \div 5^3 = 5^4$</td> </tr> <tr> <td>$(a^m)^n = a^{m \times n}$</td> <td>$(10^3)^7 = 10^{21}$</td> </tr> <tr> <td>$a^1 = a$</td> <td>$17^1 = 17$</td> </tr> <tr> <td>$a^0 = 1$</td> <td>$34^0 = 1$</td> </tr> <tr> <td>$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$</td> <td>$\left(\frac{5}{6}\right)^2 = \frac{25}{36}$</td> </tr> <tr> <td>$a^{-m} = \frac{1}{a^m}$</td> <td>$9^{-2} = \frac{1}{81}$</td> </tr> <tr> <td>$a^{\frac{x}{y}} = \sqrt[y]{a^x}$</td> <td>$49^{\frac{1}{2}} = \sqrt{49} = 7$</td> </tr> </tbody> </table>	Rule	Example	$a^m \times a^n = a^{m+n}$	$2^5 \times 2^3 = 2^8$	$a^m \div a^n = a^{m-n}$	$5^7 \div 5^3 = 5^4$	$(a^m)^n = a^{m \times n}$	$(10^3)^7 = 10^{21}$	$a^1 = a$	$17^1 = 17$	$a^0 = 1$	$34^0 = 1$	$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$	$\left(\frac{5}{6}\right)^2 = \frac{25}{36}$	$a^{-m} = \frac{1}{a^m}$	$9^{-2} = \frac{1}{81}$	$a^{\frac{x}{y}} = \sqrt[y]{a^x}$	$49^{\frac{1}{2}} = \sqrt{49} = 7$	<p style="text-align: center; color: #00a0e3;">Order of Operations</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tbody> <tr> <td style="background-color: #ffcc00;">B Brackets</td> <td>$10 \times (4 + 2) = 10 \times 6 = 60$</td> </tr> <tr> <td style="background-color: #00a0e3; color: white;">I Indices</td> <td>$5 + 2^2 = 5 + 4 = 9$</td> </tr> <tr> <td style="background-color: #cc00cc;">D Division</td> <td>$10 + 6 \div 2 = 10 + 3 = 13$</td> </tr> <tr> <td style="background-color: #990099; color: white;">M Multiplication</td> <td>$10 - 4 \times 2 = 10 - 8 = 2$</td> </tr> <tr> <td style="background-color: #00cc00; color: white;">A Addition</td> <td>$10 \times 4 + 7 = 40 + 7 = 47$</td> </tr> <tr> <td style="background-color: #009900; color: white;">S Subtraction</td> <td>$10 \div 2 - 3 = 5 - 3 = 2$</td> </tr> </tbody> </table> <p style="text-align: center; font-weight: bold;">POWERS OF 10</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tbody> <tr><td style="background-color: #90ee90;">One</td><td>1</td><td>10^0</td></tr> <tr><td style="background-color: #90ee90;">Ten</td><td>10</td><td>10^1</td></tr> <tr><td style="background-color: #90ee90;">Hundred</td><td>100</td><td>10^2</td></tr> <tr><td style="background-color: #90ee90;">Thousand</td><td>1,000</td><td>10^3</td></tr> <tr><td style="background-color: #90ee90;">Ten Thousand</td><td>10,000</td><td>10^4</td></tr> <tr><td style="background-color: #90ee90;">Hundred Thousand</td><td>100,000</td><td>10^5</td></tr> <tr><td style="background-color: #90ee90;">Million</td><td>1,000,000</td><td>10^6</td></tr> <tr><td style="background-color: #90ee90;">Ten Million</td><td>10,000,000</td><td>10^7</td></tr> <tr><td style="background-color: #90ee90;">Hundred Million</td><td>100,000,000</td><td>10^8</td></tr> </tbody> </table>	B Brackets	$10 \times (4 + 2) = 10 \times 6 = 60$	I Indices	$5 + 2^2 = 5 + 4 = 9$	D Division	$10 + 6 \div 2 = 10 + 3 = 13$	M Multiplication	$10 - 4 \times 2 = 10 - 8 = 2$	A Addition	$10 \times 4 + 7 = 40 + 7 = 47$	S Subtraction	$10 \div 2 - 3 = 5 - 3 = 2$	One	1	10^0	Ten	10	10^1	Hundred	100	10^2	Thousand	1,000	10^3	Ten Thousand	10,000	10^4	Hundred Thousand	100,000	10^5	Million	1,000,000	10^6	Ten Million	10,000,000	10^7	Hundred Million	100,000,000	10^8	<div style="border: 1px solid #ccc; padding: 5px; background-color: #e0f0ff;"> <p style="text-align: center; font-weight: bold; font-size: small;">Maths Operation Keywords</p> <table style="width: 100%; text-align: center; font-size: x-small;"> <tr> <td style="width: 25%; color: red;">+ Add Sum Plus Increase Total All together Combined More than</td> <td style="width: 25%; color: blue;">- Minus Difference Less than Decrease Subtract Take away Deduct Less Leave</td> <td style="width: 25%; color: green;">x Multiply Product Times Lots of Double Triple Groups of</td> <td style="width: 25%; color: blue;">÷ Divide Half Share Share equally Equal groups</td> </tr> </table> </div> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center; margin-top: 10px;"> <thead> <tr style="background-color: #ffcc00;"> <th>Operation</th> <th>Inverse</th> </tr> </thead> <tbody> <tr><td>+</td><td>-</td></tr> <tr><td>-</td><td>+</td></tr> <tr><td>x</td><td>÷</td></tr> <tr><td>÷</td><td>x</td></tr> <tr><td>x^2</td><td>\sqrt{x}</td></tr> </tbody> </table> <p style="text-align: center; font-weight: bold; color: white; background-color: #003366; padding: 5px;">PLACE VALUE AND ESTIMATING</p> <p>Work out an estimate for; 38.2×12.2.</p> <div style="text-align: center; font-family: monospace; font-size: 1.2em;"> $\begin{array}{r} 38.6 \times 12.2 \\ \approx 40 \times 10 \\ = 400 \end{array}$ </div> <ol style="list-style-type: none"> 1.Round each number to 1 significant figure. 2.Calculate approximate answer. <p>If $19 \times 24 = 456$ Then $19 \times 240 = 4560$ And $19 \times 2.4 = 45.6$</p>	+ Add Sum Plus Increase Total All together Combined More than	- Minus Difference Less than Decrease Subtract Take away Deduct Less Leave	x Multiply Product Times Lots of Double Triple Groups of	÷ Divide Half Share Share equally Equal groups	Operation	Inverse	+	-	-	+	x	÷	÷	x	x^2	\sqrt{x}
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<div style="text-align: center; font-size: 1.5em; font-weight: bold; color: #003366;">A x 10ⁿ</div> <div style="display: flex; justify-content: space-around; font-size: 0.8em;"> <div style="text-align: center; color: red;">Integer between 1 and 9</div> <div style="text-align: center; color: blue;">Multiplying by 10 "moves" the Decimal Point, n is the number of moves (+ or -)</div> </div>	<p style="color: red; font-weight: bold;">Positive Power = Large Number</p> <p style="font-size: 1.2em; font-weight: bold;">$4.3 \times 10^6 = 4\ 300\ 000$</p> <p style="color: red; font-weight: bold;">Negative Power = Small Number</p> <p style="font-size: 1.2em; font-weight: bold;">$2.1 \times 10^{-3} = 0.021$</p>	<p style="text-align: center; color: red; font-weight: bold; font-size: 0.8em;">HCF and LCM</p> <p style="text-align: center; font-size: 0.7em;">Find the HCF and LCM of 24 and 36</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p style="font-size: 0.7em;">HCF: $2 \times 2 \times 3 = 12$</p> </div> <div style="text-align: center;"> </div> </div> <div style="text-align: center; margin-top: 10px;"> <p style="color: red; font-weight: bold; font-size: 0.8em;">LCM: $2 \times 2 \times 2 \times 3 \times 3 = 72$</p> </div>																																																																										