



UNIT 1H NUMBER 100% SHEET

DEFINITIONS OF KEYWORDS	INDICES	SURDS	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="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="color: red; font-weight: bold;">Simplification of Surds</p> <p>We know that $\sqrt{4} \times \sqrt{9} = 2 \times 3 = 6$ (1)</p> <p>Also, $\sqrt{4 \times 9} = \sqrt{36} = 6$ (2)</p> <p>From (1) and (2), we see that $\sqrt{4} \times \sqrt{9} = \sqrt{4 \times 9}$</p>	<p>Square Numbers</p> <p>2^2 or $2 \times 2 = 4$</p> <p>3^2 or $3 \times 3 = 9$</p> <p>4^2 or $4 \times 4 = 16$</p> <p>5^2 or $5 \times 5 = 25$</p> <p>6^2 or $6 \times 6 = 36$</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <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;">+</td> <td style="width: 25%; color: blue;">-</td> <td style="width: 25%; color: green;">×</td> <td style="width: 25%; color: blue;">÷</td> </tr> <tr> <td>Add</td> <td>Minus</td> <td>Multiply</td> <td>Divide</td> </tr> <tr> <td>Sum</td> <td>Difference</td> <td>Product</td> <td>Half</td> </tr> <tr> <td>Plus</td> <td>Less than</td> <td>Times</td> <td>Share</td> </tr> <tr> <td>Increase</td> <td>Decrease</td> <td>Lots of</td> <td>Share equally</td> </tr> <tr> <td>Total</td> <td>Subtract</td> <td>Double</td> <td>Equal groups</td> </tr> <tr> <td>All together</td> <td>Take away</td> <td>Triple</td> <td></td> </tr> <tr> <td>Combined</td> <td>Deduct</td> <td>Groups of</td> <td></td> </tr> <tr> <td>More than</td> <td>Less</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Leave</td> <td></td> <td></td> </tr> </table> </div>	+	-	×	÷	Add	Minus	Multiply	Divide	Sum	Difference	Product	Half	Plus	Less than	Times	Share	Increase	Decrease	Lots of	Share equally	Total	Subtract	Double	Equal groups	All together	Take away	Triple		Combined	Deduct	Groups of		More than	Less				Leave		
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	<div style="text-align: center; font-size: large; color: blue;"> $A \times 10^n$ </div> <div style="display: flex; justify-content: space-around; font-size: small;"> <div style="text-align: center; color: red;"> <p>Integer between 1 and 9</p> </div> <div style="text-align: center; color: blue;"> <p>Multiplying by 10 "moves" the Decimal Point, n is the number of moves (+ or -)</p> </div> </div>	<p style="color: red; font-weight: bold;">Positive Power = Large Number</p> <p style="font-size: large; font-weight: bold; color: black;">$4.3 \times 10^6 = 4\ 300\ 000$</p> <p style="color: red; font-weight: bold;">Negative Power = Small Number</p> <p style="font-size: large; font-weight: bold; color: black;">$2.1 \times 10^{-3} = 0.021$</p>	<p style="color: red; font-weight: bold;">HCF and LCM</p> <p style="font-size: x-small;">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>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="border: 1px solid red; padding: 2px; color: red; font-weight: bold;">LCM: $2 \times 2 \times 2 \times 3 \times 3 = 72$</p> </div>																																																										