



Year 8 - Algebra & Indices Summary Assignment

Name: _____




The first two columns of your task show the question number and a worked example that has already been solved by a student called Jack. Sometimes Jack got the question right  other times it was wrong.  The last column gives you a turn to answer a similar question.




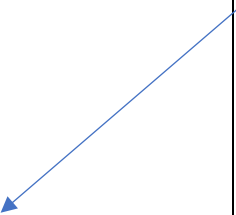
Your job is to follow the three steps below:

Step 1: Study Jack's working out carefully and ask yourself why he answered the questions in this way.

Step 2: Answer questions and explain Jack's working out.

Step 3: Carefully answer the given questions including your working out.

	Step 1: Jack's Worked Examples	Step 2: Self-Explanation Prompt/ Student Notes	Step 3: Your Turn: Write Your Solution
1	Evaluate $9p$ when $p = 3$ $= 9(3)$ $= 27$ 	What operation is found between the number and pronumeral in this expression: $9p$	Evaluate $10pq$ when $p = 2$ and $q = 4.5$
2	If $y = -1$ and $z = 4$, evaluate: $\frac{y+z}{18}$ $= \frac{(-1)+(4)}{18}$  $= \frac{3}{18}$ $= \frac{1}{6}$ 	What did Jack do in his first step?	If $y = -5$ and $z = 6$, evaluate: $\frac{y+z}{7}$

3	<p>Use the rule to complete the table of values: “The starting number is doubled, then 4 is subtracted”.</p> <table border="1"> <tr> <td>Starting number (N)</td> <td>12</td> <td>13</td> <td>14</td> <td>15</td> </tr> <tr> <td>Answer (A)</td> <td>20</td> <td>22</td> <td>24</td> <td>26</td> </tr> </table> 	Starting number (N)	12	13	14	15	Answer (A)	20	22	24	26	<p>How would the starting number need to change to have an answer of zero?</p>	<p>Use the rule to complete the table of values: “The starting number is tripled, then 5 is added”.</p> <table border="1"> <tr> <td>Starting number (N)</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>Answer (A)</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Starting number (N)	0	1	2	3	Answer (A)																
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4	<p>Complete the table of values for $y = x^2$</p> <table border="1"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>y</td> <td>9</td> <td>4</td> <td>1</td> <td>0</td> <td>1</td> <td>4</td> <td>9</td> </tr> </table> 	x	-3	-2	-1	0	1	2	3	y	9	4	1	0	1	4	9	<p>How would the values of y change if the rule was $y = x^2 + 2$ instead?</p>	<p>Complete the table of values for $y = x^3$</p> <table border="1"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>y</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	x	-3	-2	-1	0	1	2	3	y							
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5	<p>Simplify this expression: $5 - 4x + 2$</p> <p>$5 - 4x + 2$ $4x - 5 + 2$ $4x - 3$ </p> 	<p>What did Jack do wrong in his first step?</p> <p>Would it have been okay to write $5 + 2 - 4x$? Explain why or why not.</p>	<p>Simplify this expression: $10 - 7x + 5$</p>																																

<p>6</p>	<p>Expand the following two algebraic expressions:</p> $2(x + 3)$ $2(x + 3)$ $= 2(x + 3)$ $= 2(x) + 2(3)$ $= 2x + 6 \quad \checkmark$ $-2(x + 3)$ $= -2(x + 3)$ $= -2(x) + 2(3)$ $= -2x + 6 \quad \times$	<p>How does the distributive law apply to how Jack solves this question?</p> <p>What mistake did Jack make in his second last line of working out that caused him to get the wrong answer?</p>	<p>Expand the following two algebraic expressions:</p> $5(x + 6)$ $-5(x + 2)$
<p>7</p>	<p>Factorise these expressions:</p> $7hp + 14$ $\text{HCF} = 7$ $7(hp + 2) \quad \checkmark$ $-3x - 12$ $\text{HCF} = -3$ $-3(x + 4) \quad \checkmark$	<p>What does Jack mean when he writes "HCF = 7?"</p>	<p>Factorise these expressions:</p> $3hp + 21$ $-4x - 8$

<p>8</p>	<p>Factorise the following expression: $4y^2 + 12y$ HCF = $4y$ $4y(y+3)$ ✓</p> <p>Check your answer by expanding: $4y(y+3)$ $= 4y(y) + 4y(3)$ $= 4y^2 + 12y$ ✗</p>	<p>What is different about the HCF in this factorisation question, compared to question 7?</p> <p>By what process is Jack checking his answer here?</p>	<p>Factorise the following expression: $16y^2 + 2y$</p> <p>Check your answer by expanding:</p>
<p>9</p>	<p>What is the value of $(3^4)^2$ Leave your answer in index form. $(3 \times 3 \times 3 \times 3)(3 \times 3)$ $(3^4)^2 = 3^6$ ✗</p>	<p>Can you explain to Jack where he went wrong in his solution to this problem?</p>	<p>What is the value of $(3^3)^3$ Leave your answer in index form.</p>

10	<p>What is the value of $3^2 \times 3^4$ Leave your answer in index form.</p> $3^2 \times 3^4 = 3 \times 3^{(2+4)}$ $= 9^6 \quad \text{X}$	<p>Jack incorrectly multiplied the base numbers together. Use your calculator to prove that this is incorrect.</p> <p>What should the answer be? Leave in index form.</p>	<p>What is the value of $3^5 \times 3^2$ Leave your answer in index form.</p>
11	<p>Show $(2^2)^4$ in expanded form.</p> $(2^2)^4$ $= 2^2 \times 2^2 \times 2^2 \times 2^2$ $= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$ $= 2^8$ $\therefore (2^2)^4 = 2^{2 \times 4} = 2^8 \quad \checkmark$	<p>Why did Jack do this line of working?</p>	<p>Show $(3^2)^5$ in expanded form.</p>
12	<p>Use a pattern to explain why a zero index is equal to 1. Use these numbers: $3^3, 3^2, 3^1, 3^0$</p> $3^3 = 27$ $3^2 = 9 \quad \leftarrow \div 3$ $3^1 = 3 \quad \leftarrow \div 3$ $3^0 = 1 \quad \leftarrow \div 3 \quad \checkmark$	<p>What happens if the index is less than zero? Can you continue this pattern for $3^{-1}, 3^{-2}, 3^{-3}$</p>	<p>Use a pattern to explain why a zero index is equal to 1. Use these numbers: $4^3, 4^2, 4^1, 4^0$</p>

Outcome	Limited	Basic	Sound	High	Outstanding
MA4-1WM Communicates and connects mathematical ideas using appropriate terminology, diagrams, and symbols. (Self-explanation prompts)	Has completed three or less self-explanation prompts. OR self-explanation prompts are incorrect.	Has completed six or less self-explanation prompts. OR self-explanation prompts have errors.	Self-explanation prompts are mostly complete and correct. BUT have minimal use of mathematical language and keywords.	Self-explanation prompts are concise and use correct mathematical language. BUT contain some minimal errors.	Self-explanation prompts explain concepts using appropriate terminology, diagrams and symbols.
MA4-8NA Generalises number properties to operate with algebraic expressions. (Questions 1-8)	Has attempted two or less questions between questions 1-8.	Has attempted less than four questions between questions 1-8 OR has attempted all questions but has many mistakes or does not show mathematical working.	Completes five or more questions between questions 1-8 showing some mathematical working with some errors.	Completes all of questions 1-8 showing full mathematical working with minimal errors.	Completes all of questions 1-8 showing full mathematical working with no errors.
MA4-9NA Operates with positive-integer and zero indices of numerical bases. (Questions 9-12)	Has attempted none of the questions between 9-12.	Has attempted only one question between 9-12. OR has attempted all questions but has many mistakes or does not show any mathematical working.	Completes 2 or more questions 9-12 showing some mathematical working with some errors.	Completes all questions 9-12 showing full mathematical working with minimal errors.	Completes all of questions 9-12 showing full mathematical working with no errors.
Teacher Comment:					

