



Task Number	1	Task Name	Algebra and Equations Summary
Course	5.3 Mathematics	Faculty	Mathematics
Teacher	Mr Whitehall	Head Teacher	Ms Humphrys
Issue date	29/2/24	Due date	14/3/24 Period 2
Focus (Topic)	Algebraic Techniques and Equations	Task Weighting	25%

Outcomes

MA5.3-1WM uses and interprets formal definitions and generalisations when explaining solutions and/or conjectures

MA5.3-3WM uses deductive reasoning in presenting arguments and formal proofs

MA5.3-5NA selects and applies appropriate algebraic techniques to operate with algebraic expressions

MA5.3-7NA solves complex linear, quadratic, simple cubic and simultaneous equations, and rearranges literal equations

Task description

You will be completing a summary sheet on the topics Algebraic Techniques and Equations. The three sections you will be required to complete include:

- A summary of the concept
- Completing questions with full mathematical working
- Creating another question on the concept and solving with full mathematical working

The task must be completed as a hardcopy.

Marking Guidelines

Attached is a marking rubric for the task.

Year 10 5.3 – Assessment 1 Algebraic Techniques and Equations Summary

Name:

Teacher:

	Concept	Summary	Question	Create your own question and solve
Algebraic Techniques				
1	Distribution law for expanding brackets	The distributive property states that $a(b + c) = ab + ac$ therefore the multiplication applies to all terms in the brackets.	<i>Expand:</i> $3ab(a + b)$	

2	Expanding Binomials		<p>Expand:</p> $(x + 2)(2x - 3)$	
3	Multiplying algebraic fractions		<p>Simplify: $\frac{2x^2}{w} \times \frac{b}{2}$</p>	

4	Dividing algebraic fractions		<i>Simplify:</i> $\frac{x}{3} \div \frac{x}{2}$	
5	Adding algebraic fractions (Different denominators)		<i>Simplify:</i> $\frac{x}{3} + \frac{x}{2}$	

6	Subtracting algebraic fractions (Different denominators)		Simplify: $\frac{x^2}{4} - \frac{x}{3}$	
7	Factorisation (Common factor)		Factorise: $6x^2 + 18x$	

8	Factorise binomials		<p>Factorise:</p> $x^2 + 5x + 6$	
9	Factorise complex algebraic fractions		<p>Factorise:</p> $\frac{x^2 + 3x + 2}{x + 2}$	

Equations

10	Solving linear equations with brackets	$\text{Solve: } 3(x + 2) = 18$	
11	Solving linear equations with algebraic fractions	$\text{Solve: } \frac{x-2}{3} + 10 = 20$	

12	Solving quadratic equations		Solve: $2x^2 = 32$	
13	Solving quadratic equation with factorisation		Factorise and then solve: $x^2 + 6x + 8 = 0$	

14	Solving equations with substitution		<p>If $a = 2$, $b = 3$, solve for c:</p> $\frac{2c}{a} + b = 10$	
15	Solving linear inequalities on a number line		<p>Solve: $2(a + 4) \geq 24$</p>	

16	Changing the subject in a formula		<p>Make b the subject of:</p> $x = \sqrt{b^2 - 4ac}$	
17	Solving simultaneous equations		<p>Solve this simultaneous equation:</p> $\begin{cases} y = x + 5 \\ y = \frac{6}{x} \end{cases}$	

Outcome	Limited	Basic	Sound	High	Outstanding
MA5.3-1WM uses and interprets formal definitions and generalisations when explaining solutions and/or conjectures. (SUMMARIES)	Has completed 5 or less summary sections. OR summaries are incorrect and unrelated to the topic.	Has completed 8 or less summary sections. OR summaries have errors. OR summaries do not summarise concept.	Summary sections are concise and explain the concept. BUT have minimal use of mathematical language and keywords.	Summary sections explain concept concisely using correct mathematical language. BUT contain some minimal errors.	Summary sections explain concept concisely using correct mathematical language.
MA5.3-3WM uses deductive reasoning in presenting arguments and formal proofs. (CREATED QUESTIONS)	Has developed 5 or less question sections.	Has completed 8 or less question sections. OR questions contain substantial errors in working.	Has developed question sections but are very similar questions to ones provided. Questions developed are easy to solve and require minimal working.	Question sections developed require full mathematical working to solve and are related directly to the concept. BUT contains minimal errors in working.	Question sections developed require full mathematical working to solve and are related directly to the concept.
MA5.3-5NA selects and applies appropriate algebraic techniques to operate with algebraic expressions. (QUESTIONS 1-9)	Has attempted 3 or less questions between questions 1-9.	Has attempted less than 5 questions between questions 1-9. OR has attempted all questions but has many mistakes or does not show any mathematical working.	Completes 5 or more questions 1-9 showing some mathematical working with some errors but has not written answers in simplest form.	Completes all of questions 1-9 showing full mathematical working with minimal errors. BUT some answers could be simplified.	Completes all of questions 1-9 showing full mathematical working with no errors and answers written in simplest form.
MA5.3-7NA solves complex linear, quadratic, simple cubic and simultaneous equations, and rearranges literal equations. (QUESTIONS 10-17)	Has attempted 3 or less questions between questions 10-17.	Has attempted 4 or less questions between questions 10-17. OR has attempted all questions but has many mistakes or does not show any mathematical working.	Completes 5 or more questions 10-17 showing some mathematical working with some errors but has not written answers in simplest form.	Completes all of questions 10-17 showing full mathematical working with minimal errors. BUT some answers could be simplified.	Completes all of questions 10-17 showing full mathematical working with no errors and answers written in simplest form.