

Mathematics Department C2 SOW

Specification	Reference	Notes/Extra Material
<p>1. Algebra and Functions</p> <ul style="list-style-type: none"> Simplifying algebraic fractions by division Dividing a polynomial by $(x \pm p)$ Factorising a polynomial by using the Factor theorem Using the Remainder theorem 	<p>Heinemann Chapter 1</p> <p>Section 1.1</p> <ul style="list-style-type: none"> Exercise 1A <p>Section 1.2</p> <ul style="list-style-type: none"> Exercises 1B & 1C <p>Section 1.3</p> <ul style="list-style-type: none"> Exercise 1D <p>Section 1.4</p> <ul style="list-style-type: none"> Exercise 1E <p>Summary of key points</p>	<p>Only division by $(x + a)$ or $(x - a)$ will be required.</p> <p>Candidates should know that if $f(x) = 0$ when $x = a$, then $(x - a)$ is a factor of $f(x)$</p> <p>Candidates may be required to factorise cubic expressions such as $x^3 + 3x^2 - 4$ and $6x^3 + 11x^2 - x - 6$.</p> <p>Candidates should be familiar with the terms 'quotient' and 'remainder when the polynomial $f(x)$ is divided by $(ax + b)$.</p> <p>Mixed Exercise 1F Revision Exercise 1</p>

<ul style="list-style-type: none"> Knowledge & use of $\tan \theta = \frac{\sin \theta}{\cos \theta}$ And $\sin^2 \theta + \cos^2 \theta = 1$ Solution of simple trigonometric equations in a given interval 	<p>Heinemann Chapter 10 Section 10.1 - Exercise 10A</p> <p>Sections 10.2 – 10.4 - Exercises 10B, 10C & 10 D</p> <p>Summary of key points</p>	<p>Candidates should be able to solve equations such as</p> <p>$\sin(x - \pi/2) = 3/4$ for $0 < x < 2\pi$ $\cos(x + 30) = 1/2$ for $-180 < x < 180$ $\tan 2x = 1$ for $90 < x < 270$ $6\cos^2 x + \sin x - 5 = 0$ for $0 \leq x < 360$</p> <p>Mixed Exercise 10E Revision Exercises 2, 6, 8 & 10</p>
<p>5. Exponential and logarithms</p> <ul style="list-style-type: none"> $y = a^x$ and its graph Laws of logarithms The solution of equations of the form $a^x = b$ 	<p>Heinemann Chapter 3</p> <p>Section 3.1 - Exercise 3A</p> <p>Sections 3.2 – 3.4 - Exercises 3B, 3C, & 3D</p> <p>Sections 3.5 – 3.6 - Exercises 3E & 3F</p> <p>Summary of key points</p>	<p>To include</p> <p>$\log_a xy = \log_a x + \log_a y$ $\log_a x/y = \log_a x - \log_a y$ $\log_a x^k = k \log_a x$ $\log_a 1/x = -\log_a x$ $\log_a a = 1$</p> <p>Candidates may use the change of base formula.</p> <p>Mixed exercise 3G Revision Exercise 3</p>

<p>6. Differentiation</p> <ul style="list-style-type: none"> Applications of differentiation to maxima & minima and stationary points, increasing & decreasing functions. 	<p>Heinemann Chapter 9</p> <p>Sections 9.1 – 9.3 - Exercises 9A, 9B & 9C</p> <p>Summary of key points</p>	<p>The notation $f''(x)$ may be used for the second derivative.</p> <p>To include applications to curve sketching. Maxima and minima problems may be set in the context of a practical problem.</p> <p>Mixed Exercise 9D Revision Exercise 9</p>
<p>7. Integration</p> <ul style="list-style-type: none"> Evaluation of definite integrals Interpretation of the definite integral as the area under a curve. Approximation of area under a curve using the trapezium rule. 	<p>Heinemann Chapter 11</p> <p>Section 11.1 - Exercises 11A</p> <p>Sections 11.2 – 11.4 - Exercises 11B, 11C & 11D</p> <p>Section 11.5 - Exercise 11E</p> <p>Summary of key points</p>	<p>Candidates will be expected to be able to evaluate the area of a region bounded by a curve and given straight lines. e.g. Find the finite area bounded by the curve $y = 6x - x^2$ and the line $y = 2x$</p> <p>$\int x \, dy$ will not be required.</p> <p>e.g. Evaluate $\int_0^1 \sqrt{2x + 1} \, dx$ using the values of $\sqrt{2x + 1}$ at $x = 0, 0.25, 0.5, 0.75$ and 1.</p> <p>Mixed Exercise 11F Revision Exercise 11</p>