

St Stephen's School

YEAR 11 MAT 2AB

PROGRAMME 2009

Text: *A J Sadler. Unit 2A, Unit 2B*

Week	Curriculum Council Objective and Content	Ref	Assessment
1.1 1.2	Unit 2A Preliminary Work 1.1 Estimation and calculation 1.1.1 use the connections between the four arithmetic operations 1.1.2 apply the rule of order when calculating 1.1.3 use mental and written methods to calculate and estimate with integers, decimals, fractions between 0 and 1, common percentages of whole numbers and of decimals to two decimal places 1.1.4 round and truncate as part of estimation and calculation 1.1.5 use multiplication and division in situations involving ratios 1.1.6 use calculators to calculate with integers, decimals, fractions and percentages, powers, square roots and cube roots.	Preliminary Work Ch 1	
1.3	1.4.1 calculate profit, loss, discount and commission 1.4.2 determine 'best buys', use comparison, ratio and proportion.	Ch 2	I1 (6%) Graphs p 75 - 78
1.4	1.3.1 solve direct proportion problems 1.3.2 relate the ideas of proportion and direct variation to linear functions.	Ch 3	
1.5	1.2.1 locate, plot and interpret points in the four quadrants of the Cartesian plane; reason whether or not to join the points 1.2.2 recognise that continuous lines and curves on a graph consist of points 1.2.3 sketch and interpret graphs that represent relationships in contexts such as water filling a vase 1.2.4 identify linear relationships in the form $y = mx + c$ – formulate linear rules for tables of values – determine tables of values for linear rules, recognise many values are possible besides the ones chosen – use tables of values to graph linear rules – read points from a line graph and recognise they satisfy the rule for the line – read gradient and vertical intercept of line graphs and link gradient to difference pattern in tables – formulate linear rules from graphs – graph lines from rules using gradient and vertical intercept. 1.2.5 use the function facilities of calculators and computer spreadsheets.	Ch 4	

1.6	1.3.1 recognise that letters stand for variable numbers in algebra, including when translating between word and algebraic statements 1.3.2 use algebraic conventions such as $2 \times k = 2k$, and $k \times k = k^2$ 1.3.3 collect like terms in algebraic expressions 1.3.4 use the distributive property: – to expand expressions of the form $(ax \pm b)(cx \pm d)$ – to factorise linear expressions such as $8k - 4$.	Ch 5	T1 (5%) Ch 1 - 4
1.7 1.8	1.3.5 solve linear equations graphically and algebraically, expanding and gathering like terms where appropriate	Ch 6	I2 (6%) Patterns p 103 Pythagorean triples P 162
1.9	Interpret data 3.3.1 read information from tables, circle graphs (pie charts) with simple percentages, and frequency graphs, reading between calibrations on scales 3.3.2 discern advantages/ disadvantages of using frequency graphs rather than tables to display data 3.3.3 discern the relative advantages and disadvantages of the various 'averages' (mean, median, mode) 3.3.4 compare datasets by describing spread of graphed data, and using mean, median, lowest and highest scores and range 3.3.5 use mathematical words that acknowledge uncertainty when comparing data sets such as 'scores for ... <i>tend</i> to be more spread than scores for ...' 3.3.6 calculate numbers of data in categories from relative frequency and proportions 3.3.7 report on collected data (to include justifying sampling methods and explaining what graphs and summary values show).	Ch 7	
1.10 1.11	Collect and organise data 3.1.1 plan the collection of measurement data and fair (unbiased) samples to investigate situations specified by the teacher 3.1.2 plan recording sheets 3.1.3 collect and record data, and check and edit the record 3.1.4 group data in tables with provided equal-sized class intervals. Represent data 3.2.1 construct one- and two-way frequency tables and dot frequency plots 3.2.2 construct frequency histograms for ungrouped data and data grouped in equal-sized class intervals 3.2.3 sketch the notional shape of frequency graphs (not from points) 3.2.4 calculate mean, median and mode for ungrouped frequency data 3.2.5 calculate mean for grouped data and median and modal classes	Ch 8	T2 (10%) Ch 5 - 7

	3.2.6 calculate relative frequency, and proportions of data in fractional, decimal and percentage forms 3.2.7 describe spread of datasets informally, using terms such as data are spread out, tightly packed, clusters, gaps, more/less dense regions, outliers 3.2.8 describe spread using range and lowest and highest scores.		
1.12	2.1.1 use Pythagoras's theorem to calculate the length of sides of right triangles 1.3.7 solve equations arising from application of Pythagoras's theorem.	Ch 9	
1.13	Transformations 2.2.1 identify translations, reflections and rotations of figures in two dimensions 2.2.2 produce patterns which exhibit symmetries, rotations, reflections and translations 2.2.3 use geometric conventions in drawing and geometric language to describe figures and patterns.	Ch 10	
1.14	Review 2A		
1.15 – 1.17	Exams		Exam Sem 1 (15%)
1.18 1.19 1.20	Unit 2B Preliminary Work 2.1 Measurement 2.1.1 use surface area and volume formulas directly and inversely for – cubes, right prisms and pyramids cylinders, cones and spheres (decimal answers only).	Ch 4	I3 (6%) Simulations P 93-98
2.1	1.1 Estimation and calculation 1.1.1 use mental and written methods to calculate and estimate with integers, decimals, fractions between 0 and 1, common percentages of whole numbers and of decimals to two decimal places 1.1.2 use calculators to calculate with integers, decimals, fractions and percentages, powers, square roots and cube roots 1.1.3 convert numbers to and from scientific notation.	Ch 2	
2.2 2.3	1.3 Equivalence, equations and inequalities 1.3.1 without a calculator solve equations with one algebraic term such as $2x^2 + 1 = 19$, $3x^3 = 24$ 1.3.2 solve linear equations and simple linear inequalities algebraically 1.3.3 set up simultaneous linear equations, using the forms $y = mx + c$ and $ax + by = c$, and solve the equations algebraically (unique solution only) 1.3.4 solve simultaneous linear equations graphically 1.3.5 solve exponential equations graphically and algebraically (simple cases with no leading coefficients e.g. $2^x = 64$).	Ch 3	
2.4	1.2 Functions and graphs 1.2.1 graph exponential relationships, $y = b^x$ for $b > 1$, $x \geq 0$ 1.2.2 recognise linear and exponential functions from equations, tables and graphs 1.2.3 interpret linear and exponential functions for practical situations.	Ch 9	

2.5	1.4 Patterns	Ch 10	T3 (10%)
2.6	1.4.1 state recursive word rules for number sequences, identifying starting numbers 1.4.2 describe number sequences recursively using algebraic notation such as $T_{n+1} = T_n + 3$, $T_1 = 4$ 1.4.3 use recursive rules to continue sequences, including rules that involve simple percentages 1.4.4 investigate numbers such as adding two odd numbers: – identify patterns – conjecture generalisations – test conjectures with further cases – provide explanations that support or refute conjectures – use mathematical language to explain patterns.		Ch 2,3,4,9
2.7	3.1 Conduct chance experiments 3.1.1 simulate everyday chance events with outcomes that are not equally likely. 3.2 Quantify chance 3.2.1 use long-run relative frequency to estimate probabilities 3.2.2 list sample spaces for one-stage events, with repetition to reflect possible outcomes 3.2.3 calculate simple probabilities, using sample spaces and the number of favourable outcomes divided by the total number of outcomes, for one-stage events 3.2.4 use fractions, decimals and percentages to describe probability and move freely between them 3.2.5 use the fact that probabilities sum to 1 to calculate probabilities for complementary events 3.2.6 use the facts that probabilities sum to 1 and range from 0 to 1 to check probabilities. 3.3 Interpret chance 3.3.1 predict the results for repetition of simulations with the same number of trials 3.3.2 use probabilities to predict proportions and number of outcomes that are likely to satisfy provided criteria in n trials 3.3.3 recognise predictions are not always realised 3.3.4 recognise the law of large numbers (that individual outcomes of chance events are unpredictable but the relative frequency stabilises as the number of trials becomes large) 3.3.5 order outcomes from least likely to most likely, using fractional, decimal and percentage probabilities explain probability statements in common usage	Ch 5	I4 (7%) Patterns P 129-142
2.8	3.3.6 identify factors that could compromise a simulation of everyday chance events 3.3.7 use chance terminology when describing events ('probability of', 'complement of').	Ch 6	
2.9	3.4 Interpret data 3.6.1 read information from scatterplots and plots of time series data, reading between calibrations on scales 3.6.2 predict using interpolation and extrapolation and trend lines fitted by eye, recognising the dangers of extrapolation 3.6.3 report on collected data (to include assessing how to improve data collection and handling).	Ch 7	
2.10	3.5 Collect and organise data 3.4.1 plan the collection of bivariate or time-series data to investigate situations specified by the teacher 3.4.2 predict what data will show	Ch 8	T4 (10%) Ch 5,6,7,8,10

	3.4.3 collect and record data, and check and edit the record. 3.6 Represent data 3.5.1 plot points and construct line graphs for time-series data, plotting between calibrations on scales, if necessary 3.5.2 construct scatterplots for bivariate data, plotting between calibrations on scales, if necessary 3.5.3 describe trend as increasing or decreasing, for bivariate and time-series data 3.5.4 sketch notional increasing and decreasing trends (not from points) 3.5.5 fit trend lines 'by eye' over plotted points.		
2.11	2.2 Coordinate geometry 2.2.1 determine: – distance between two points – the gradient of a line joining two points. 2.2.2 determine the equation of a line given: – a point on the line and the gradient – two points on the line.	Ch 11	
2.12	2.1.2 use sine, cosine and tangent ratios to calculate sides and angles (degree measure) of right triangles (two-dimensional contexts only; exact trigonometric ratios involving surds are not required).	Ch 12	
2.13	2.3 Networks 2.3.1 represent information using network diagrams and interpret the diagrams (basic networks only, project networks not included) 2.3.2 investigate the traversability of networks 2.3.3 develop systematic methods to determine the shortest path between two vertices of a network.	Ch 1	
2.14	Review 2A and 2B		
2.15	Exam 2A and 2B		Exam Sem 2
2.16			(35%)

Assessment Schedule

Type	Number	Weightings %	Total %
Investigations	4	6, 6, 6, 7	25
Tests	4	5, 10, 10, 10	35
Exams	2	15, 25	40

Full details of the Calculus syllabus is found at the Curriculum Council website at www.curriculum.wa.edu.au