

December 1, 2001

Colleagues:

The document that follows was originally designed to be printed in landscape orientation at 100% size. I give one of these outlines to each student. We are each on a strict Xerox "clicks" budget at my school so I decided to save some clicks by printing the document in portrait orientation at 75% size. One other advantage of this portrait orientation is that the outline can be read without turning your binder sideways. This size is still readable, but only just. If you don't have to conserve clicks and want to print at full size, but cannot manipulate this file into that shape, you can email me and I will send you my full size version (gzak@pacificcoast.net). I have set the headers to not appear on the first page of this document, so you may want to adjust that parameter if you tweak this and use it.

This is the outline I am using at Reynolds Secondary School in Victoria for the PMA10 course. We are a semestered 8-12 school. Typically our first semester has about 88 or 89 useable class periods and our second semester has about 84 or 85 (not counting early dismissals for parent teacher interviews, FSA tests, accreditation surveys, assemblies, course selection classes, suicide awareness classes, careers day, earthquake drills, fire drills, false alarms, assemblies, report card distribution, yearbook distribution, textbook distribution, textbook collection, fees collection, locker allocation, locker inspection, locker cleanout, semester turnaround day, or the first 2 days of school in September as instructional time for mathematic). Math classes meet once each day for 80 minutes on Monday to Thursday and for 60 minutes on Friday.

In general I do one row of the outline per day. I altered the order of the chapters after my first time through the course to what you see in the outline. My reasoning for starting with Trig, Chapter 8, is that it takes some students a while to understand so I want to give the slower ones more time to catch up, and also it is something brand new to them – not algebra. Chapters 6, 7, 3, 4, 5, 1, and 2 are in that order for reasons that escape me now (since I haven't taught the course since the first year it was introduced) but I do remember as seeming perfectly valid at the time. I left Chapter 9 to the end deliberately in case I didn't get to finish, as I felt that it was the most dispensible of the chapters, although I actually did manage to finish the course on our timetable as described above.

Feel free to transmogrify any aspect of this outline.

Enjoy!

Gary Zak

#	Section, Title, & Topics	Assignment	Date	✓
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Principles of Math 10 - Outline of Assignments

N.B. (“nota bona”, Latin for “note well”)

Unless otherwise specified, you may “scan” the following assignments. To “scan” means that in a multi-part question, say, 1a, 1b, 1c, 1d, 1e, where each part is simply a “drill” on the same concept, you would do 1a and 1e, the first and the last one in the question - then mark them and if you got them right, go on to the next one. If you got one of them wrong, then do 1b and 1d. Keep going until you get both right. You may do this if you feel really confident that you understand the concept being practiced. If you feel a bit shaky on it then you should probably do the entire multi-part question. Note that some questions are labelled multi-part, but each part actually addresses a slightly different concept; for these, you should do the entire question. The textbook authors suggest that being able to do the assignments listed here represents “basic competency” in the respective concepts. Those students who want to extend themselves a bit should also try one or more of the “C” level questions. These have a complete solution key which you can get from your teacher or find on the computers.

In either case do not start the problems until you have understood the ideas from having listened in class and read the text, including the examples. Your job is to understand the math ideas involved there. You should do the problems to see how well you understood the ideas. Ask for the teacher’s help when an example is unclear, not just when you are stuck on a question.

Assignments are due the period following the lesson date. In many cases you will need to ask questions the following period about the previous period’s assignment. Therefore there will be no late penalty. However, if you leave completion of assignments longer than a couple of days, you will just keep falling further and further behind and get discouraged and fail and lose the chance to make big bucks as an adult mathematician. Use the “√” section to keep track of completed work. Enter your assignment mark and test scores here so you will have a record of marks from which you can calculate your grade at any time.

Read the assignment carefully. Some of these assignments (the ones without section numbers) may be partly or totally for bonus marks, to be done only if you want the bonus marks. Some of them have parts, however that must be done by everyone, so check carefully.

Checklist for getting full marks on assignments:

first and last name in top right hand corner of top page?	full description (assignment, page, and question numbers) at top?
done readably on non-ripped looseleaf paper?	question numbers in margins? two columns maximum?
all pages in order? stapled together neatly?	multi-step questions in style of examples in text or your notes?
sketches shown for graphing calculator questions?	no significant erasures?
all questions marked with a tick, cross, or question mark?	all questions finally corrected and completed?

Abbreviations you could get on an assignment:

N.C.Y.	no credit yet - find out what I’m giving you a chance to fix, fix it, and hand it in again for credit
S.A.W.	show all work - for questions that have more than one step I expect you to show how you got your answer. If you used a calculator, fine, but show me what you did on the calculator by labelling the numbers you write down. If you used a graphing calculator, show a sketch and window sizes, and label the curves.
M.C.R.	mark, correct, and resubmit
N.F.	not finished - I may just give you a low mark or I may hand it back and give you a chance to finish it
S.N.	section number - you didn’t note what chapter and section it is

#	Section, Title, & Topics	Assignment	Date	✓
	Chapter 8			
8.1	<i>The Tangent Ratio</i> - opposite over adjacent	Read p. 452 - 456, Do p. 457 #1 - 6, 9, 10, 14, 16, 17		
8.2	<i>The Sine and Cosine Ratios</i> - opposite over hypotenuse and adjacent over hypotenuse	Read p. 460 - 463, Do p. 464 #1 - 5, 8 - 10, 14 - 17, 20, 21		
	<i>The Spiral Tunnels</i> - p. 468, 469	For bonus marks. Do all questions and hand in.		
8.3	<i>Solving Right Triangles</i> - using trig to get all parts of the triangle	Read p. 470 - 473, Do p. 474 #1 - 5, 7, 9, 12, 13, 15		
	<i>Indirect Measurement</i> - p. 478, 479	Everyone must do this and hang on to the results for later use.		
	<i>Calculating the Speed of Earth's Rotation</i> - p. 480, 481	Everyone must read this. For bonus marks, do all questions on p. 481		
8.4	<i>Problems Involving More than One Right Triangle</i> - real life stuff	Read p. 482 - 484, Do p. 484 #1 - 3, 6 - 8, 11, 12, 14, 15		
8.5	<i>Defining the Sine and Cosine of an Obtuse Angle</i> - definitions of sine and cosine that are based on the "Unit Circle"	Read p. 490 - 496, Do p. 496 #1 - 4, 7, 8		
8.6	<i>Solving Triangles That Are Not Right-Angled</i> - solution? - turn them into right angle triangles!	Read p. 499 - 503, Do p. 503 #1, 2, 4 - 6		
8.7	<i>The Sine Law</i> - a good shortcut for 8.6	Read p. 505 - 509, Do p. 509 #1 - 7, 10, 11, 14, 15, 17, 18		
8.8	<i>The Cosine Law</i> - the other shortcut for 8.6	Read p. 513 - 517, Do p. 517 #1 - 4, 7 - 10, 14, 16, 18, 20 - 22		
	Review of Chapter 8	Do p. 524 all		
	Chapter 8 test			
	Chapter 6			
6.1	<i>Measurement Formulas and Monomials</i> - Spheres and Cubes	Read p. 326 - 328, Do p. 328 # 1, 2, 4 - 8, 11, 14, 18, 19, 20		
	<i>Archimedes of Syracuse</i> p. 332 -	Everyone must read this. For bonus marks answer the questions.		
6.2	<i>Multiplying and Dividing Monomials</i> - doing operations on tiny algebraic expressions	Read p. 333 - 334, Do p. 335 # 1 - 10, 12, 13, 17, 19		
6.3	<i>Adding and Subtracting Polynomials</i> - doing operations on bigger algebraic expressions	Read p. 340 - 341, Do p. 341 # 3, 5 - 13		
6.4	<i>Multiplying Monomials and Polynomials</i> - doing operations on tiny and bigger algebraic expressions all mixed up	Read p. 344 - 347, Do p. 347 #1 - 6, 14, 16, 17, 19, 21		
	<i>Round Robin Scheduling</i> - p. 352, 353	Everyone must read this. For bonus marks do the questions.		
6.5	<i>Multiplying Polynomials</i> - complicating the doing of operations on bigger algebraic expressions just to make the average teenager's life totally, like, miserable.	Read p. 354 - 356, Do p. 356 #1 - 4, 6, 10, 17 - 19, 21		
	<i>Graphing the Surface Area and Volume of a Box</i> - p. 361	For bonus marks - use a graphing calculator or the GrafEq program in the Maclab.		
6.6	<i>Factoring Trinomials of the Form $x^2 + bx + c$</i> - OK, so now you can multiply expressions to get a product - so what...try starting with the product and working backwards to see where it came from!	Read p. 362 - 364, Do p. 364 #1 - 6, 8, 9, 12, 13, 16, 20		
	<i>Verifying Trinomial Factorizations</i> - p. 368	For bonus marks, do all questions.		
6.7	<i>Factoring Trinomials of the Form $ax^2 + bx + c$</i> - If you got the easy ones in 6.6, try these ugly ones!	Read p. 369 - 371, Do p. 371 # 1, 3, 4, 5, 6, 8, 10, 15		
6.8	<i>Factoring a Difference of Squares</i> - memorize the pattern	Read p. 374 - 376, Do p. 376 #3 - 7		
6.9	<i>Solving Quadratic Equations</i> - the easy kind, that factor rather neatly, rely on the "Zero Principle"	Read p. 380 - 383, Do p. 384 #1 - 5, 10, 11		
6.10	<i>Dividing a Polynomial by a Binomial</i> - so you loved long division in grade 5 arithmetic? Now try it on algebra expressions - surprise - it's the same thing!	Read p. 386 - 389, Do p. 389 #1 - 6, 8 - 10, 12, 17		
	Review of Chapter 6	Do p. 393 all		
	Chapter 6 test			
	Chapter 7			
7.1	<i>Evaluating Rational Expressions</i> - "Plugin" questions with cautions.	Read p. 400 - 402, Do p. 402 #1 - 8, 11 - 16		
7.2	<i>Simplifying Rational Expressions</i> - reducing fractions all over again!	Read p. 405 - 407, Do p. 407 #1 - 5, 7, 8, 11 - 13		
	<i>Verifying Rational Simplifications</i> - p. 410	For bonus marks. Do all questions on GrafEq in Maclab or on graphing calculators.		
7.3	<i>Multiplying and Dividing rational Expressions</i> - operations on algebra fractions.	Read p. 411 - 413, Do p. 413 #1 - 7, 11, 12, 15		

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7.4	<i>Adding and Subtracting Rational Expressions: Part I</i> - remember common denominators?	Read p. 418 - 420, Do p. 421 #1 - 8, 11 - 13, 18, 20		
	<i>Exploring the Lens Formula</i> - p. 424	Everyone must read this. For bonus marks hand in the question.		
7.5	<i>Adding and Subtracting Rational Expressions: Part II</i> - ugly, horrible, long expressions to perform operations on!	Read p. 426 - 428, Do p. 428 #1 - 7, 11, 13, 14, 17		
	<i>7.6 Solving Equations Involving Rational Expressions</i> - self explanatory	Read p. 431 - 433, Do p. 434 #1 - 5, 7, 8, 11		
7.7	<i>Applications of Rational Expressions</i> - self explanatory again!	Read p. 436 - 439, Do p. 439 #1 - 4, 7, 9, 10, 13		
	<i>Exploring Averages</i> - p. 442, 443	Everyone must read p. 442 and answer and hand in the question on p. 442 and staple it to 7.7. For bonus marks do the ones on page 443 as well.		
	<i>Speed-Time Graphics</i> - p. 444	For bonus marks hand in all questions.		
	Review of Chapter 7	Do p. 393 all		
	Chapter 7 test			
	Chapter 3			
3.1	<i>Length of a Line Segment</i> - Pythagoras pops up again!	Read p. 146 - 148, Do p. 149 #1 - 4, 6 - 9, 13, 14, 18, 21		
	<i>Shortest Networks</i> - p. 154, 155 - at least read the text even if you decide not to go for the bonus marks.	For bonus marks, do the activities on p. 154, 155, and hand in paper evidence of your explorations - no penalty for not handing anything in.		
3.2	<i>Midpoint of a Line Segment</i> - a "double average" kind of thing!	Read p. 156 - 158, Do p. 158 #1 - 3, 5 - 12, 14, 20		
3.3	<i>Slope of a Line Segment</i> - "steepness" defined	Read p. 162 - 165, Do p. 166 #1, 3, 4, 8, 10 - 12, 16 - 18		
	<i>Building the Best Staircase</i> - p. 170, 171	Everyone must read p. 170, 171 and for bonus marks hand in your corrected answers to the questions. No penalty for no hand-ins.		
	<i>Length, Midpoint, and Slope of a Line Segment</i> - p. 172 - 174	Do only for bonus marks, investigations 1 and 2 and hand in paper evidence of your investigations - no penalty for not handing anything in.		
3.4	<i>Slopes of parallel Line Segments</i> - segments that have the same "steepness"	Read p. 175 - 177, Do p. 177 #1, 3 - 5, 7 - 9, 13, 14		
	<i>Solving Equations of the Form ...</i> - p. 182, 183	Everyone must read this, then scan #1 to 7 and hand in, appropriately labeled and stapled to 3.5.		
3.5	<i>Slopes of Perpendicular Line Segments</i> - segments whose slope values are negative reciprocals of each other!	Read p. 184 - 186, Do p. 187 #1, 3 - 5, 9 - 13, 15, 18		
	<i>Square Patterns on a Grid</i> - p. 190, 191	For bonus marks - do all questions and hand in.		
	Review of Chapter 3	Do p. 192 all		
	Chapter 3 test			
	Chapter 4			
4.1	<i>Using an Equation to Draw a Graph</i> - <i>Investigating Hall Rental Costs</i> - p. 205, 206	Read p. 198 - 201, Do p. 1 - 6, 9, 10		
		Bonus marks only - if you can get hold of a TI - 83 graphing calculator you can do this activity and hand in for bonus marks.		
4.2	<i>The Slope of a Line</i> - Is there any difference between the slope of a line segment and the slope of the whole line?	Read p. 207 - 210, Do p. 1 - 6, 10, 12, 15, 17		
	<i>Investigating $y = mx + b$</i> - p. 213	Use "GrafEq" in the Maclab to play with p. 213, and hand in your answers for bonus marks - make a real effort to do this one as it will pay off for you handsomely in the future.		
4.3	<i>The Equation of a Line: Part I</i> - the "slope - intercept" form.	Read p. 214 - 217, Do p. 217 #1 - 7, 9 - 11, 20, 21		
	<i>Patterns in Equations and Lines</i> - p. 221	For bonus marks, read and hand in your answers.		
	<i>How Slope Applies to Speed and Acceleration</i> - p. 222, 223	For bonus marks.		
4.4	<i>The Equation of a Line: Part II</i> - finding the equation of a line, given minimal information about the line	Read p. 224 - 225, Do p. 226 #1 - 6, 9, 11, 13		

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4.5	<i>Interpreting the Equation $Ax + By + C = 0$</i> - extracting information about the intercepts and slope of a line when its equation is given in standard form <i>The Vanishing Square Puzzle</i> - p. 236, 237 <i>Sequences and $Ax + By + C = 0$</i> - p. 240 Review of Chapter 4	Read p. 229 - 232, Do p. 233 # 1 - 6, 9 - 12, 18 Do these activities for bonus marks. Make sure your reader knows what the question is as you answer it. For bonus marks. Do p. 241 all		
	Chapter 4 test			
	Chapter 5			
5.1	<i>What is a function?</i> - not the social kind - the math kind!	Read p. 246 - 249, Do p. 250 # 1 - 7, 11, 15, 16		
5.2	<i>Interpreting Graphs of Functions</i> - What do all those wavy lines mean???? <i>Some Examples of Functions</i> - p. 265	Read p. 255 - 258, Do p. 258 # 1 - 5, 8, 13, 14, 16 Everyone must do this page and staple it to 5.3.		
5.3	<i>Finding Relationships in Data</i> - Don't be silly - Data is an emotionless android, incapable of forming meaningful relationships.	Read p. 266 - 269, Do p. 269 # 1 - 7, 11 - 13		
5.4	<i>Linear Functions: Part I</i> - non-vertical straight lines <i>The Line of Best Fit</i> - p. 286, 287 <i>Use a Graph</i> - p. 288, 289	Read p. 274 - 279, Do p. 279 # 1 - 3, 5, 8 - 11, 14, 16, 18, 19 For bonus marks. Everyone must read p. 288 and do p. 289 # 1 - 4, 8 and staple to 5.5		
5.5	<i>Linear Functions: Part II</i> - graphs that model direct variation	Read p. 290 - 294, Do p. 295 # 1 - 4, 6, 9, 11, 14		
5.6	<i>Function Notation</i> - mathematical symbols for functions <i>Absolute Value</i> - p. 310, 311	Read p. 304 - 307, Do p. 307 #1 - 7, 9, 10, 15, 16 Everyone must read and do p. 310, 311 and staple to 5.7		
5.7	<i>Relations</i> - "functions" that break the "rules" and give you "two for one" or better. <i>Classifying Functions</i> - p. 319	Read p. 312 - 316, Do p. 316 # 1 - 7, 9 Read p. 319 and learn the six categories of functions listed there. It is not necessary to hand any thing in from this page, but if you want a bonus question credit, answer #2 with proof.		
	Review of Chapter 5	Do p. 320 all		
	Chapter 5 test			
	Chapter 1			
1.1	<i>Arithmetic Growth</i> - A sequence of numbers with a common difference between terms.	Read p. 4 - 7, Do p. 7 #1 - 6, 9 - 11		
1.2	<i>The General Term of an Arithmetic Sequence</i> - a formula that describes any term in the sequence: $t_n = a + (n - 1)d$ <i>Arithmetic Sequences and Linear Functions</i> - p. 300, 301 - seeing some mathematical connections	Read p. 10 - 13, Do p. 13 #1 - 7, 9, 10 Everyone must read p. 300, 301 and do all questions on p. 301 and staple to 1.2		
1.3	<i>Arithmetic Sequences in Astronomy</i> - Halley's comet keeps coming back! <i>The Sum of an Arithmetic Series</i> - put "plus" signs between each of the terms of an arithmetic sequence, and it's called an arithmetic series. The formula that gives you the total is: $S_n = n(a + t_n) / 2$	Read p. 16 and think through the answers - check in back of text. Read p. 17 - 20, Do p. 20 #1, 2, 3, 5, 7, 10 - 13		
1.4	<i>Geometric Growth</i> - A sequence of numbers with a common ratio between terms.	Read p. 23 - 27, Do p. 27 #1, 2, 3, 4, 8, 9		
1.5	<i>Revisiting the Exponent Laws</i> - quick tricks for doing operations on power terms.	Read p. 32 - 35, Do p. 35 #1 - 12, 13 (all), 14		
1.6	<i>Working with Data in Tables</i> - bussing at the Star Trek Cafe <i>How many Kernels of Wheat</i> - the clever servant!	Read p. 37 - 40, Do p. 40 #1 - 4, 6 - 8 Read p. 44, 45 and think through the answers - check in back of text.		
1.7	<i>Sequences in Tables: Part I</i> - loans and investments arranged in tables	Read p. 46 - 50, Do p. 50 #1 - 4, 6		

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1.8	<i>How Long Will It Take for an Investment to Double in Value?</i> - spreadsheet fun - see teacher for tutorial instruction sheet. <i>Sequences in Tables: Part II</i> - more loan amortization tables <i>Calculating Loan Payments</i> - playing "what if?..." with spreadsheets.	Read p. 53 and try out the spreadsheet on a computer - hand in your answers to #2 on a separate sheet stapled to 1.8. Read p. 54 - 58, Do p. 58 #1 - 11 Do p. 62, 63 #1 to 4 and your choice of #6 or #7 to get bonus marks - no penalty if you just look at it on the computer and don't hand anything in.		
	Review of Chapter 1	Do p. 65 #1 - 6 (all)		
	Chapter 1 test			
	Chapter 2			
2.1	<i>Radicals</i> - bomb-throwing extremists? - nope, it means "roots" of numbers	Read p. 68 - 72, Do p. 72 #1 - 9, 10 (all), 11 (all), 18 - 20		
2.2	<i>Extending the Exponent Laws to Rational Exponents</i> - fractions as exponents	Read p. 76 - 80, Do p. 80 #1 - 14, 16 (all), 18 (all), 19 (all)		
2.3	<i>Bird Eggs</i> - p. 94, 95 - use the computers and spreadsheets to do this activity only if you like birds and biology and are interested in how scientists come up with their theories using mathematics <i>Applications of Rational Exponents</i> - formulas involving growth	Nothing to hand in - just think about what you learned and ask the teacher about parts you didn't understand. Read p. 86 - 90, Do p. 90 #1 - 3, 6, 7, 10		
2.4	<i>The Pythagorean Theorem</i> - What an ancient Greek noticed about right angle triangles and how it blew their notions of what numbers were right out of the water. <i>Significant Digits</i> - p. 106, 107 - a very important concept for scientific measurement	Read p. 96 - 98, Do p. 99 #1 - 5, 9 Read and then write your own explanation of what the concept of "significant digits" means and hand it in stapled to 2.4.		
2.5	<i>Irrational Numbers</i> - numbers that you cannot get by dividing one integer by another integer.	Note: 2.5 will be done orally in class and need not be handed in. We will read p. 101 - 104 and do p. 104 #1, 2, 4 - 8, (all) 12 (all) together.		
2.6	<i>Relating the Sides of Special Triangles</i> - irrational numbers pop all over the place	Read p. 108 - 110, Do p. 110 #1 - 6, 11 - 13, 17		
2.7	<i>Squaring the Circle</i> - a 4000 year old problem solved <i>Multiplying Radicals</i> - Don't turn your back on them - they breed like rabbits!	Read p. 114 and try a couple of the questions on p. 115 for fun - see teacher for solutions Read p. 116 - 119, Do p. 119 #1 - 7, 10, 11, 14 (all), 18 - 20 (all), 23		
2.8	<i>Dividing Radicals</i> - They are less dangerous if they are divided!	Read p. 123 - 126, Do p. 127 #1 - 4, 6 (all), 9 - 13		
2.9	<i>Adding and Subtracting Radicals</i> - just like adding and subtracting terms!	Read p. 129 - 132, Do p. 132 #1 - 8, 12, 13, 15, 18		
2.10	<i>Combined Operations with Radicals</i> - a nifty trick to turn an irrational denominator into a rational one.	Read p. 135 - 137, Do p. 138 #1 - 7, 9 - 16, 19		
	Review of Chapter 2	Do p. 141 - 142 #1 - 19		
	Chapter 2 test			
	Chapter 9			
9.1	<i>The Nature of Surveys</i> - or, "Don't Believe Everything You Read!" <i>Random Numbers</i> - p. 536, 537	Read p. 530 - 533, Do p. 533 #1 - 8, 11, 12 Everyone must do this and staple it to 9.2.		
9.2	<i>Methods of Sampling</i> - the key to the believability of survey results. <i>Make a Sampling Box</i> - p. 543 and <i>Sampling Box Simulators</i> - p. 544	Read p. 538 - 539, Do p. 540 #1 - 3, 5, 6, 9, 10, 12, 13 Everyone must read this. Everyone must either make the sampling box, or set up the graphing calculator simulation, or the spreadsheet simulation.		
9.3	<i>From Population to Sample</i> - box plots for binomial outcomes	Read p. 545 - 549, Do p. 549 #1 - 7, 9 - 11, 14, 15		
9.4	<i>From Sample to Population</i> - how accurately do samples represent the populations they are drawn from? <i>Estimating the Size of a Wildlife Population</i> - p. 560, 561	Read p. 555 - 557, Do p. 557 #1 - 9, 12 - 14 Everyone must read p. 560. For bonus marks, do all questions.		
	Chapter 9 test			