MPM1D9 Course Summary and Timeline

Understanding Mathematics

Focus on ***MEANING*** instead of appearance.

e.g. $3+x$ and $3(+x)$ look a lot alike but have very different meanings.

Summary of Units 0 to 3

Unit Number and Name	***Main Ideas/Principles***
Unit 0- Introduction to Mathematical Thinking	• Simple Model of Mathematics: Objects, Operations and Relationships • Measurement and Geometry Relationships • A knowledge of formulas is ***not enough*** and in itself ***does not*** constitute mathematical thinking! Formulas are merely the ***finished products*** of mathematical thinking. • True mathematical thinkers seek to ***discover*** and ***understand*** how quantities are ***related*** to one another. • Mathematical shortcuts and "tricks" should not be used by those who have not yet achieved a deep understanding of the concepts being learned. Once the concepts are mastered, shortcuts can be used but always with caution. ***Shortcuts that compromise understanding should never be used!***
Unit 1- Number Sense and Algebra	• Algebra is nothing more than arithmetic with unknowns. • As such, algebra can be ***understood*** quite easily if one has a thorough grasp of basic mathematical operations (+, −, ×, ÷, powers, etc.) and the order in which they should be applied ("BEDMAS"). • + / − → "gain" / "loss", like terms ("2 apples + 5 apples = 7 apples") • × / ÷ → "groups of" / "how many groups of", expanded form, exponent laws • + / × → commutative and associative (order doesn't matter, nor do brackets) • − / ÷ → ***not*** commutative or associative (order and brackets ***do*** matter) • The distributive property
Unit 2- Solving Equations	• To maintain equality, whatever operation is performed to one side of an equation ***must*** also be performed to the other side. • By choosing an appropriate set of operations that is applied to both sides, all linear equations can be reduced to the form $ax+b=c$, where x is the unknown and a, b and c are constants. • Once a linear equation is reduced to the form $ax+b=c$, the solution can be found by ***undoing*** the operations in the order ***opposite*** of BEDMAS. • Many problems can be modelled using linear equations. In such cases, it is simply a matter of translating the statement of the problem into an equation, which is then solved using the techniques described in unit 2. • These same techniques can also be used to rearrange formulas, that is, to solve for one variable in terms of all the others.

Unit Number and Name	***Main Ideas/Principles***

Unit 3- Analytic Geometry	• Analytic Geometry bridges the gap between algebra and geometry.
	• Relations can be described using words, tables, equations and graphs.
	• Unit 3 focuses on ***linear relations***, the simplest of all mathematical relationships. Linear relations are divided into two classes:
	  ○ ***Direct Variation*** e.g. Sakshi earns $15 per hour
	  ○ ***Partial Variation*** e.g. Michelle earns a base salary of $25000 plus 5% of sales.
	• Linear relations are completely characterized by the equation $y = mx + b$, where x is the independent variable, y is the dependent variable, m is the slope and b is the y-intercept.
	• Linear relations have a constant rate of change. That is, the dependent variable changes at a rate that is constant with respect to the independent variable. Another way of putting this is as follows: if Δx is constant, then Δy is also constant (i.e. the ***first differences*** are constant).
	• Relations that are not linear are called ***nonlinear***. Nonlinear relations have a variable slope (rate of change). If the equation of a nonlinear relation is known, then calculus can be used to determine the slope (rate of change) at any point.
	• m = slope = constant of variation = rate of change of y with respect to x
	• b = y-intercept = vertical intercept = initial value

The Rest of the Course

Unit	***Important Points***	***Completion Date***
Unit 3- Analytic Geometry	• Most of this unit has already been completed. • Pages 26-28 are optional BUT it is a good review of measurement relationships as seen from the point of view of analytic geometry. • Do review problems: pp. 29-34 • Extra Review: Unit 3 menu on www.misternolfi.com • Unit 3 practice test on www.misternolfi.com	Thursday, May 7, 2015

Unit 4-Linear Relations	• This unit builds upon unit 3 but the focus changes to an in-depth study of the properties of linear relations.
	• Carefully study the explanations and examples given in unit 4.
	• Complete all activities and homework
	• Also complete the following found in the unit 4 menu:
	  ○ Interpreting Graphical Information
	  ○ Parallel/Perpendicular Problems
	  ○ Extra Review
	  ○ Practice Test
		Wednesday, May 19, 2015

Check back in a few days for updates.