

Hillel Academy High School



Grade 9
Accelerated Mathematics
End of Year Study Guide
September 2013 - June 2014

Examination	Duration	Date
<p style="text-align: center;">The exam consists of <u>2 papers</u>:</p> <p><u>Paper 1</u>: Short Response <i>Calculators Allowed</i></p> <p><u>Paper 2</u>: Structured Response <i>Calculators Allowed</i></p>	<p style="text-align: center;">1 ½ hours</p> <p style="text-align: center;">2 hours</p>	<p style="text-align: center;">June 2014</p>

GRADE 9 (Accelerated) MATHEMATICS**Materials Needed: Pens, Pencils, Erasers, Geometry Set, 30cm Ruler and Scientific Calculator****HOW TO STUDY MATH**

- ✓ WITH PAPER & PENCIL! Not your eyes and headphones! You can't study Math by looking at the



notes, you MUST PRACTICE!!!!

- ✓ Use your own notebook(s) to help you revise. Make notes and try the examples to ensure you understand the concepts.

- ✓ Go over your old assignments- homework, classwork & test. Look at the mistakes you made. Do



you know how to do all questions correctly now?

- ✓ Practice more questions in your weak areas. Additional questions can be found in your textbook or online. If you are not sure how to do a question, look at the solution. Copy it out carefully, trying to understand the processes involved then try to do it again independently, without the solution in front of you. If you are still having problems ask a friend, parent, tutor, or teacher for help.



- ✓ Plan your study time systematically. Set aside at least 45 minutes every day to revise and practice mathematics.

- ✓ Start now! Do not wait until the week of the exam!

Mathematics is a continuous subject and requires that you build on your previous knowledge base. So though the exam will focus on the areas indicated below, it will also require that you remember concepts taught in previous years.

(eg Time, Percentages, Ratio, Inequalities, Geometry, Transformations – translation, reflection etc)

ALGEBRA

Students should be able to:

- Manipulate algebraic expressions by:
Expansion, Factorization (H.C.F. grouping, quadratic expressions, difference of squares, perfect squares)
- Simplify expressions (including fractions).
- Evaluate and simplify Indices
- Evaluate and simplify surds
- Solve linear equations and inequalities
- Solving quadratics using factorization, formula and by completing the square.
- Solve simultaneous equations with linear and non-linear equations
- Solve absolute value equations
- Solve radical equations
- Solve equations with rational exponents
- Solve exponential/indicial equations
- Transpose formulae
- Use $y = kx$ or $y = \frac{k}{x}$ for variation (direct & indirect) problems

NUMBER THEORY

Students should be able to:

- Identify the categories of numbers that exists within the Real Number System
- Round number to specific number of :decimal places, significant figures
- Obtain upper and lower bounds to:
 - numbers given to a specified accuracy given to a specified accuracy.
 - solutions of simple calculations given to a specified accuracy.
- Write number in standard form, perform calculations in standard form
- Write recurring decimals as fractions

SEQUENCES

Students should be able to:

- Recognize patterns in sequences and relationships between different sequences
- Generalise to simple algebraic statements (including expressions for the nth term) relating to such sequences.

FUNCTIONS, RELATIONS & GRAPHS

Students should be able to:

- Define and identify :One to one, one to many, many to one, many to many relations
- Evaluate basic functions, inverse functions and composite functions
- Draw the graphs of and solve problems using the graphs of : quadratics, cubic, reciprocal, exponential function

COORDINATE GEOMETRY

Students should be able to:

- determine the equation of a straight line from the graph of the straight line
- determine the equation of a straight line given the coordinates of two points on the line
- solve equations graphically i.e. using the graph of a straight line
- determine the gradient and y – intercept of a straight line given its equation
- draw/sketch the graph of a straight line given its equation - table of values, x – and y – intercepts and y – intercept and gradient
- determine the equation of a straight line *parallel* to another line given the equation of the original line and the coordinates of a point on the new line
- determine the equation of a straight line *perpendicular* to another line given the equation of the original line and the coordinates of a point on the new line
- calculate the length of a line segment given the coordinates of its endpoints
- calculate the midpoint of a line segment given the coordinates of its endpoints

TRIGONOMETRY

Students should be able to:

- Solve problems involving Pythagoras' Theorem (including algebraic equations)
- Use Trig ratios to find missing side or angles
- Solve questions on angle of elevation and depression, bearings
- Use Sine and Cosine rules to find missing side or angles
- Solve simple trig problems in three dimensions including angle between a line and a plane

MENSURATION

Students should be able to:

- Find the perimeter and areas of plane shapes and compound shapes (including sectors)
- Find areas of triangles – using semi-perimeter formula and the sine formula
- Volume and Surface areas of Plane and Compound Solids
- Solve problems involving similar shapes & solids