# Grade 9 Academic Math

## Unit 1 – Measurement
- Perimeter and Area
- Pythagorean Theorem
- Volume
- Surface Area

## Unit 2 – Polynomials
- Proportions
- Evaluating Expressions
- Exponent Laws
- Add/Subtract/Multiply Polynomials
- Expanding and Simplify Algebraic Expressions

## Unit 3 – Equations
- Solving Equations
  - Simple
  - Using Distribution
  - Involving Fractions

## Unit 4 – Linear/Non-Linear Relations
- Direct and Partial Variation
- Interpolation and Extrapolation
- Point of Intersection
- Linear and Non-Linear

## Unit 5 – Analytic Geometry
- Slope
- Slope as a Rate of Change
- Equations of Lines
- Graphing Linear Equations
  - Using slope and y-intercept
  - Using intercepts

## Unit 6 – Equations of Lines
- Standard and Slope y-intercept form
- Finding Equations of Lines
- Parallel and Perpendicular Lines
- Horizontal and Vertical Lines

## Unit 7 – Relationships
- Distance Time Graphs
- Interpreting Graphs
- Scatter Plots
- Lines/Curves of Best Fit
- Equations of Lines of Best Fit

## Unit 8 – Geometry
- Interior and Exterior Angles
- Polygon Properties

## Unit 9 – Optimization
- Optimization of Rectangles
- Optimization of Cylinders and Rectangular Prisms

# Final Exam Review Questions

## Questions From Textbook

Pg. 178 #13, 15, 16, 18, 19, 21 – 23

Pg. 237 #4 – 6

Pg. 356 #1 – 4, 6(a), 8 – 18

Pg. 520 #1, 2, 4, 8(a), 9 - 15

## Questions not Covered in Textbook

1. For each question :
   i)     Introduce your variables and identify the independent and dependent variables
   ii)    Determine the equation
   iii)   Complete the table of values
   iv)    Graph the relation on a grid
   v)     State whether each is partial or direct variation
   vi)    Answer the questions

   a) Rydel works in a factory.   Each week he earns $400 plus $5 for every machine part he assembles.   How much will Rydel earn in a week if he assembles 30 parts?  How many parts did he assemble if he earned $1000?    If Rydel gets a raise so that he is earning $450 per week and $6 per part, how would the graph change? {0, 50, 100, 150}

   b) Tom earns $12 per hour as a life guard at a wave pool.    How many hours must Tom work to earn $240?    After a year, Tom gets a raise so that he earns $15 per hour, how would this change the graph? {0, 5, 10, 15}

   c) Samantha works at the GAP.    She earns $300 per week, plus a commission of 10% of her sales.    Find Samantha's earnings for a week if her sales totalled $6500.    If Samantha aims to earn at least $825 a week, what is her minimum sales target for a week?    How would the graph change if Samantha starts making 15% commission on all of her sales? {0, 2000, 4000, 6000}

2. Determine the equation for each of the following lines.
   a) Points (3, 6) and (-2, 6) are on the line
   b) A line that is parallel to $x = 3$ and passes through the point (-4, 3)
   c) The slope is undefined and point (3, 9) is on the line
   d) The slope is 0 and the point (2, 1) is on the line
   e) The line with slope -3 and y-intercept 2
   f) The line with slope 2 and passing through the point (1, 3)
   g) The line that passes through the points (2, 5) and (5, 14)