APPLICATIONS OF MATHEMATICS 10

CURRICULUM CONNECTIONS

NUMBER

It is expected that students will:

A1 perform arithmetic operations on irrational numbers, using appropriate decimal approximations
Clarification: Limit irrational numbers to square roots, cube roots and π.

A2 create and modify tables *or spreadsheets* from both recursive and nonrecursive situations
Clarification: Exam questions may involve performing arithmetic operations on tables and spreadsheets.

A3 use and modify a spreadsheet template to model recursive situations
Clarification: Exam questions may involve formulas in recursive and nonrecursive spreadsheets.

A4 solve problems involving combinations of tables, using:
- addition or subtraction of two tables
- multiplication of a table by a real number
- spreadsheet functions and templates

PATTERNS AND RELATIONS: *Relations and Functions*

It is expected that students will:

B1 plot linear data, using appropriate scales
Clarification: Exam questions may involve window settings for a graphing calculator.

B2 represent linear data using linear function models including:
- ordered pairs
- word descriptions
- graphs (including *piecewise linear functions*)
- equations
- tables of values

B3 use function notation to evaluate and represent linear functions

B4 determine the following characteristics of the graph of a linear function given its equation or graph:
- *x*- and *y*-intercepts
- slope
- domain
- range

B5 construct the graph of a linear function given its equation in slope-intercept form $(y = mx + b)$:
- manually
- using a graphing calculator

B6 solve problems involving partial variation and arithmetic sequences as applications of linear functions
Clarification: Partial variation refers to equations of the form $y = mx + b$

SHAPE AND SPACE: *Measurement*

It is expected that students will:

C1 solve problems involving two right triangles using trigonometry and the Pythagorean Theorem
Clarification: Triangles will share a common side or angle and triangles may be in different planes.

C2 extend the concepts of sine and cosine for angles through 180°

C3 apply the sine and cosine laws to solve problems (excluding the ambiguous case)

C4 find lengths, areas, volumes and mass using measurement strategies, appropriate units of measure (SI and Imperial systems), and appropriate instruments including:
- tape measure
- metre/yard stick
- ruler
- trundle wheel
- bathroom scale
- decigram scale
- Vernier callipers
- micrometer

C5 calculate the volume and surface area of a sphere, using formulas that are provided
Clarification: May include hemisphere; may include solving for radius.

C6 determine the relationships among linear scale factors, areas, the surface areas and the volumes of similar figures and objects

C7 solve problems involving length, area, volume, time, mass and rates derived from these
Clarification: May include conversions within and between Imperial and metric systems.

C8 interpret drawings and use the information to solve problems

SHAPE AND SPACE: *3-D Objects and 2-D Shapes*

It is expected that students will:

C9 solve problems involving distances between points in the coordinate plane

C10 solve problems involving midpoints of line segments

C11 solve problems involving rise, run and slope of line segments

C12 determine the equation of a line given information that uniquely determines the line
Clarification: Determine equation of a line given:
- *slope and y-intercept*
- *slope and a point*
- *two points on a line (can be solved using linear regression)*
- *a graph of the line*

STATISTICS AND PROBABILITY: *Data Analysis*

It is expected that students will:

D1 determine the equation of a line of best fit using:
- estimate of slope and one point
- least squares method with technology (*graphing calculator*)

D2 use a calculator to determine the correlation coefficient *r* of a data set

D3 interpret the correlation coefficient *r* and its limitations for varying problem situations, using relevant scatter plots

D4 apply line-fitting and correlation techniques to analyze experimental results