GRADE 9 NSC MATHEMATICS CURRICULUM

TERM 1

Unit 1 Numbers:

Indices, Matrices

Objectives

1. State the meaning of a^m, where a and m are whole numbers s.

2. Simplify expressions using the laws of indices.

3. Evaluate the expressions: a^m, $a^m \times b^n$ and $\frac{a^m}{b^n}$ where a, b, m, n, are whole numbers, integers, fractions.

4. Write numbers less than, greater than or equal to 10 in standard form.

5. Identify the order of a matrix.

6. Perform scalar multiplication.

7. Perform calculations to illustrate the commutativity and distributivity of matrices under addition.

UNIT 2 Measurement:

Circles

Objectives

1. Investigate and use the relationship between the radius and the area of a circle $A = \pi r^2$.

2. Investigate and use the relationships between the radius, diameter, circumference and pi.

3. Calculate the area and circumference of a circle.

4. Identify the arc, sector and segment of a circle.

5. Find the area of a sector, segment or parts thereof of a circle with the use of angles.

6. Find arc length.

UNIT 3 Geometry:

Trigonometry

Objectives

4. Use trigonometric ratios to find unknown quantities in right-angled triangles only.

5. Use trigonometric ratios to solve problems related to angles of elevation and depression.

6. Calculate unknown angles in given diagrams and word problems.

7. Prove Pythagoras' theorem by a suitable method (for example by the area method).

8. Use the Pythagoras' Theorem to solve right-angled triangle problems.

UNIT 4 Algebra:

Distributive Property, Algebraic Fractions, Factorization and Simultaneous Equations

Objectives

1. Use the distributive property to simplify expressions including the laws of indices.

2. Apply the distributive property to multiply two binomial expressions.

3. Add and subtract simple algebraic fractions.

4. Multiply and divide simple algebraic fractions.

5. Factorize simple algebraic expressions where there is a simple algebraic common factor other than 1

6. Solve simultaneous equations by the method:

      a) Substitution

      b) Elimination

TERM 2

Unit 1 Numbers:

Ratio and Proportion, Consumer Arithmetic

Objectives

14. Solve more complex problems involving ratio and proportion.

15. Calculate the total utility bill to be paid from given instructions.

16. Explain and use in the proper context terms relating to the computation of wages and salaries (wages, salaries, bonuses, commissions, basic pay, overtime pay, gross pay, net pay, statutory and nonstatutory deductions, taxable income, tax allowance).

17. Calculate the wage and/ or salary of an employee from given instructions.

UNIT 3 Geometry:

Transformation – Enlargement and Reflection

Objectives

1. State the relationships between an object and its image in a plane when it is enlarged from a point (centre of enlargement), with given scale factor, in that plane.

2. Perform enlargements with the centre at the origin with scale factor k.

3. Perform reflections and identify images of objects where the mirror line is any given line in the plane.

UNIT 4 Algebra:

Relations, Functions and Graphs

Objectives

16. Define a function as a many-to-one or one-to-one relation.

17. Distinguish between the graph of a relation and the graph of a function.

18. Use the functional notations, for example, $f : x \rightarrow 2x + 1$, $y = f(x)$.

19. Determine the range value that corresponds to a given domain value by evaluating the function at the stated domain value;

20. State the domain and range of a given function;

21. Distinguish between functions defined for different domains by the same formula.

22. Write a quadratic mapping as a set of ordered pairs

23. Plot the ordered pairs of a quadratic mapping as a graph

24. Interpret the points of intersection of a quadratic graph with the axes

Unit 5 Statistic and Probability:

Simple Experiments, Data Collection and Simple Probabilities

Objectives

1. Design and conduct simple experiments, to collect data.

2. Determine simple probabilities and draw appropriate conclusions.

3. Use fractions and percentages to describe probability.

4. Interpret a probability given as a fraction or percentage.

TERM 3

Unit 1 Numbers:

Sets and Logic

Objectives

8. Solve simple problems involving, at most, three subsets of the universal set (with at most two intersecting).

9. Establish the truth value of compound propositions using truth tables.

10. Use truth tables to determine if two propositions are logically equivalent.

11. Define an argument.

12. Differentiate between valid argument and valid conclusion.

13. Apply deductive reasoning to determine the validity of arguments.

UNIT 4 Algebra:

Vectors

Objectives

7. Define a vector as the sum total of horizontal and vertical displacement.

8. Write vectors in column format.

9. Define and position vectors given two points. 10. Use grid to locate and draw, position and relative position vectors.

10. Use the Grid to locate and draw position and relative position vectors

11. Draw a right angled triangle representing a vector.

12. Use Pythagoras' theorem to find the length of a vector.

13. Write the reverse vector (- x) given a vector x (multiply a vector by -1).

14. Find the relative position vector of collinear vectors given a ratio of division.

15. Use the properties of an appropriate polygon to find the relative position vector of parallel, non-collinear vectors