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Preparation for University Engineering and Science Courses

1. **Essential Topics**
   Which, if any, of the following topics are essential? What depth of coverage is needed? When should essential topics be taught?

   - Algebra: factoring, simplifying and manipulating rational functions; factor theorem, remainder theorem, etc.
   - Functions and their properties (without calculator): linear, quadratic, polynomial, trigonometric, logarithmic, exponential.
   - Geometry and trigonometry.
   - Data analysis.
   - Vectors and matrices.
   - Limiting processes: sequences, series, limits, fractals.
   - Derivatives, integrals.

2. **Thinking Skills**

   - Perseverance: problems that take time, persistence and several attempts to solve.
   - Estimation/reflection/intuition: spotting obvious nonsense in a draft solution; when (not) to look at the answer at the back of the book.
   - Visualization: using sketches to gain insight.
   - Translation: words into mathematics and vice versa.
   - Role of logic and proof; communication of reasoning and results.
   - Problem solving with several steps, several topics.

3. **Implementation**

   - How do the requirements discussed in the previous two sessions differ from those for other students?
   - What kinds of resources are available for help in the classroom? Are they widely used?
   - Streaming: Do we need it? When? How?
   - Assessment: Role (if any) of provincial exams: who should set them, what kinds of questions should they use, what should be the syllabus (should topics from earlier grades be included in final exams of later grades)? Is there a need for university entrance exams? In general does testing enhance or inhibit learning?
   - Implications for teacher preparation?
   - Role of math contests?
   - Role of technology?