

# Key Math Concepts

Cheat sheet by grade level

# How to use this document

This cheat sheet covers the Quebec mathematics curriculum from Grade 1 through CEGEP. Each page is self-contained — print only the level you need, or keep the full PDF on your phone.

## For each level, you'll find:

- **Key concepts** — what your child learns this year
- **Three common stumbling blocks** — where students trip up
- **How to check understanding** — concrete questions to ask at home
- **If they're stuck** — which resource or intervention is the right fit

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**Tip:** *this document accompanies our complete guide to math tutoring on [tutoraide.ca/en/blog](https://www.tutoraide.ca/en/blog).*

# Elementary — Grade 1

*Approximately ages 6-7*

## Key concepts

- Recognize and write numbers up to 100
- Add and subtract within 20 (without then with regrouping)
- Skip-count by 2s, 5s, and 10s
- Recognize basic geometric shapes (circle, square, triangle, rectangle)
- Tell time on the hour and identify days of the week
- Recognize coins and solve simple money problems

## Three common stumbling blocks

- Mirror-digit confusion (6/9, 2/5) — common and developmentally normal in Grade 1
- Jumping from concrete manipulation to written numbers too quickly
- Wanting to "go fast" at the expense of understanding

## How to check understanding

- Ask: "What's  $8 + 5$ ?" without materials — they should answer in about 5 seconds
- Ask: "How many counters do I have in my hand?" with 12-15 objects — they should count comfortably

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**If they're stuck:** What helps most at ages 6-7: 10-15 minutes a day of math games (cards, dice, dominoes), not workbook drills.

# Elementary — Grade 2

Approximately ages 7-8

## Key concepts

- Read, write, and compare numbers up to 1,000
- Add and subtract with regrouping up to 100
- Understand place value (ones, tens, hundreds)
- First introduction to multiplication (equal groups)
- Measure in cm, m, g, kg, mL, and L
- Tell time to the half-hour and quarter-hour

## Three common stumbling blocks

- Regrouping ("carrying the 1") applied mechanically without understanding why
- Place value not solid — confuses 24 with 42
- Word problems where the operation needs to be chosen

## How to check understanding

- Ask: "Which digit is worth more in 87 — the 8 or the 7? Why?" — they should say the 8 because it's tens
- Pose a problem: "I have 24 candies, I give away 9. How many do I have left?" — they should identify it's a subtraction

**If they're stuck:** This is the year place value gets built. If it stays fuzzy, all the arithmetic that follows will be fragile.

# Elementary — Grade 3

*Approximately ages 8-9*

## Key concepts

- Read, write, and compare numbers up to 10,000
- Master times tables 1 through 10
- Divide with and without remainders (simple division)
- Understand simple fractions ( $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ )
- Measure perimeter and calculate area with unit squares
- Recognize right, acute, and obtuse angles

## Three common stumbling blocks

- Times tables not automatic — the student recounts each time
- Fractions seen as "two numbers" rather than as a single quantity
- Division poorly understood ("how many times does it fit?")

## How to check understanding

- Ask: " $7 \times 8$ ?" — they should say 56 in under 3 seconds, no recounting
- Draw a pizza: "If I cut it in 4 and you eat 2 slices, what fraction did you eat?" — they should say  $\frac{2}{4}$  or  $\frac{1}{2}$

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**If they're stuck:** If times tables aren't solid by end of Grade 3, that's the absolute priority before moving on. 5-10 minutes a day, several months.

# Elementary — Grade 4

*Approximately ages 9-10*

## Key concepts

- Multi-digit multiplication (3-digit  $\times$  2-digit)
- Single-digit divisor division (introduction to long division)
- Equivalent fractions, comparing them
- Introduction to decimals (tenths and hundredths)
- Calculate perimeter and area with formulas (rectangle, square)
- Measure angles with a protractor

## Three common stumbling blocks

- Equivalent fractions misunderstood — student sees  $\frac{1}{2}$  and  $\frac{2}{4}$  as different
- Long division: order of steps not memorized
- Decimals seen as disconnected from fractions

## How to check understanding

- Ask: "Is  $\frac{1}{2}$  the same as  $\frac{3}{6}$ ?" — they should say yes and explain why
- Ask: "Is 0.75 more or less than 0.8?" — they should say 0.8 is bigger

**If they're stuck:** This is the year fractions and decimals connect. If either remains fuzzy, plan targeted review before Grade 5.

# Elementary — Grade 5

Approximately ages 10-11

## Key concepts

- Master operations on fractions (addition, subtraction)
- Perform all four operations on decimals
- Understand percentages (50%, 25%, 75%, 10%)
- Know fraction-decimal-percentage equivalence
- Calculate area of triangles and parallelograms
- Read and interpret bar and circle graphs

## Three common stumbling blocks

- Adding fractions with different denominators without finding a common denominator
- Confusion between 0.5 (one half) and 5 (the digit)
- Percentages without connection to equivalent fractions

## How to check understanding

- Ask: " $1/3 + 1/4$ ?" — they should know they need a common denominator (12) before adding
- Ask: "What's 25% of 80?" — they should say 20 and explain that 25% is one quarter

**If they're stuck:** Operations on fractions are the key to secondary 1-2. Weakness here is the #1 cause of algebra struggles later.

# Elementary — Grade 6

Approximately ages 11-12 • Ministry exam year

## Key concepts

- Perform all operations on fractions and decimals
- Apply percentages to everyday situations (discounts, taxes, tips)
- Understand order of operations
- Calculate areas and volumes of composite figures
- Introduce negative integers
- Work with ratios and proportionality

## Three common stumbling blocks

- Order of operations applied incorrectly (multiplication before addition)
- Insufficient mental math — student leans too heavily on the calculator
- Multi-step problems: difficulty organizing the approach

## How to check understanding

- Ask: " $3 + 4 \times 2$ ?" — they should say 11, not 14
- Pose a problem: "A \$60 sweater is on sale at 25% off. With taxes (15%), how much do I pay?" — they should be able to solve it step by step

**If they're stuck:** The June ministry exam counts for 50% of the final grade. See our [2026 ministry exams guide](#).

# Secondary 1

*Approximately ages 12-13*

## Key concepts

- Know number sets (naturals, integers, rationals)
- Master all operations on fractions
- Work with proportions and percentages in context
- Introduce variables and algebraic expressions
- Solve simple single-variable equations (e.g.,  $2x + 3 = 11$ )
- Calculate perimeter and area of composite figures

## Three common stumbling blocks

- The shift from concrete to abstract: "x" as an unknown number
- Fractions still fragile — becomes critical in algebra
- Wanting to go too fast: skipping steps in the solution

## How to check understanding

- Ask: "If  $2x + 3 = 11$ , what's x?" — they should say 4 and explain how they got there
- Ask them to simplify: " $2/3 + 1/4$ " — they should do it without a calculator

**If they're stuck:** Secondary 1 is the pivot year between arithmetic and algebra. Five or six well-targeted tutoring sessions can prevent difficulties that last all the way to Sec 5.

# Secondary 2

Approximately ages 13-14

## Key concepts

- Manipulate real numbers (including negatives and fractions)
- Simplify and expand algebraic expressions
- Solve multi-step linear equations
- Graph linear functions (slope, y-intercept)
- Apply the Pythagorean theorem
- Recognize properties of triangles and quadrilaterals

## Three common stumbling blocks

- Negative signs mishandled (e.g.,  $-(3 - 5) = ?$ )
- Slope seen as a memorized formula, not a rate of change
- Pythagoras applied to non-right triangles

## How to check understanding

- Ask: "What's the slope of the line through (1, 2) and (3, 8)?" — they should say 3
- Ask: "In a right triangle with legs 3 and 4, what's the hypotenuse?" — they should say 5

**If they're stuck:** If linear functions are fuzzy, secondary 3 (factoring, affine functions) will be very hard. Address it now.

# Secondary 3

Approximately ages 14-15 • Stream selection for Sec 4

## Key concepts

- Work with exponents and roots
- Manipulate polynomials (addition, subtraction, multiplication)
- Factor (simple and double factoring)
- Solve systems of two linear equations
- Use trigonometry in right triangles (sin, cos, tan)
- Study linear and inverse-variation functions

## Three common stumbling blocks

- Factoring: no single method, the student needs to recognize the right tool
- Trigonometry: confusion between sin, cos, and tan
- Skipping steps in solving systems of equations

## How to check understanding

- Ask: "Factor  $x^2 + 5x + 6$ " — they should get  $(x+2)(x+3)$
- Ask: "In a right triangle, the angle is  $30^\circ$  and the hypotenuse is 10. What's the opposite side?" — they should use sin and get 5

**If they're stuck:** This is the year the CST/TS/SN choice gets prepared. A student aiming for SN with under 75% in Sec 3 likely needs consolidation before Sec 4.

# Secondary 4 — Stream Selection

Approximately ages 15-16 • June ministry exam

## Key concepts

- **CST** (Culture, Society, Technology): finance, statistics, practical geometry, simple optimization
- **TS** (Technical-Sciences): analytical geometry, polynomial functions, linear optimization
- **SN** (Natural Sciences): polynomial and rational functions, vector geometry, trigonometric identities
- All streams: contextualized problem-solving (CD2)
- All streams: complete and justified solution method (points are lost on the method, not the answer)

## Three common stumbling blocks

- Stream choice misaligned with CEGEP ambitions — verify prerequisites of intended programs
- CD2 (contextualized problems) treated as technical exercises without modeling
- Incomplete method: the right answer without steps doesn't earn full marks

## How to check understanding

- Ask: "What's the difference between CST and TS in two sentences?" — they should explain it clearly
- Ask: "Which CEGEP programs require SN?" — they should name engineering, pure sciences, medicine

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**If they're stuck:** The June 10 and 18 exam counts for 50% of the final grade. See our [Sec 4 revision guide](#).

# Secondary 5

Approximately ages 16-17 • Grade counts for the R-score

## Key concepts

- **CST 5:** linear optimization, advanced statistics, financial math (interest, annuities)
- **TS 5:** exponential and logarithmic functions, advanced analytical geometry
- **SN 5:** trigonometric functions, vectors in 2D and 3D, advanced trigonometric identities
- All streams: ministry exam for students still taking math
- All streams: the final grade goes into the R-score (cote R)

## Three common stumbling blocks

- Underestimating the exam because year grades were good
- Poor time management on exam day (3 hours, multiple contextualized problems)
- Method forgotten under pressure — losing easy marks

## How to check understanding

- Have them do a full mock exam in 3 hours, no artificial breaks — that's the best diagnostic
- Ask: "How is your R-score calculated?" — if they have no idea, talk to the guidance counselor at the target CEGEP

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**If they're stuck:** The Sec 5 math exam is on June 18, 2026. See our [Sec 5 revision guide](#).

# CEGEP — Sciences

Courses 201-NYA, NYB, NYC (Calculus I, II and Linear Algebra)

## Key concepts

- **NYA — Differential Calculus:** limits, derivatives, applications, extrema
- **NYB — Integral Calculus:** integration, integration techniques, applications, series
- **NYC — Linear Algebra and Vector Geometry:** 2D/3D vectors, matrices, systems of equations
- Accelerated pace: 15 weeks for content equivalent to a full year of high school
- Typical prerequisite: SN 5 (NYA and NYC) or TS 5 (accepted in some programs)

## Three common stumbling blocks

- Believing high school methods are enough — at CEGEP, you need to show the proof, not just the answer
- Studying only before the exam — the pace is too fast for that
- Underestimating NYC: vectors and matrices are destabilizing for many

## How to check understanding

- Ask: "What's the derivative of  $x^3 - 4x$ ?" — expected:  $3x^2 - 4$
- Ask: "How are you preparing for the final exam?" — if they say "I'll start the week before," that's a signal

**If they're stuck:** At CEGEP, tutoring is targeted: before mid-terms and finals. Two or three well-placed sessions can save a semester.

# When to consult a math tutor

*Three simple criteria — at any level*

## Get a tutor if:

- Grades drop across several consecutive chapters (not just one)
- Your child avoids math homework or takes twice as long as before
- They freeze on concepts they mastered last year
- They're choosing a Sec 4 stream (CST/TS/SN) and want to consolidate first
- They're aiming for a contingent CEGEP program with 75-80% in math
- They're starting a calculus course at CEGEP and have already failed a test

## Wait if:

- It's an isolated bad grade in a single chapter
- Your child finds math "boring" but their grades are good
- You're panicking two weeks before an exam and they've never wanted to study (a tutor in two sessions can't replace months of missed work)

### Need a hand with math?

Our tutors work with students from elementary through CEGEP across Quebec — in-home in Montreal, Laval, Longueuil, Brossard, Repentigny, and several other cities, or online anywhere in Canada.

Rates start at \$33/h. Eligible for Quebec's tax credit.

**Request a math tutor** →

**Going further:** see our complete guide to math tutoring or the level-specific ministry exam guides (Sec 4, Sec 5).