Welcome to Mr. Amory Wong’s PreCalc 12 Class!
WORK and education

- Electronic Arts – 20 years
- PlayLand, 7-Eleven, Moki’s Pizza, and more
- SFU Bachelors of Math and Computing Science
- SFU Bachelors of Education
- Douglas College, UBC, Langara College, VVI
Personal

- Family guy
- Farming
- Sports
- Math and Computer
- Creating and Fixing
Philosophy

• Professional
• Caring
• Collaborative
• Patient
• Innovative
Students’ Advice

Advice would you give to next year’s class?
- Don’t stress too much, don’t fall behind schedule, and just try your best.
- Stick with the schedule or ahead of it.

year’s class?
- Don’t try to do the works at the end.

Nat advice would you give to next year’s class?
- Ask questions in class.
- Do your homework.
- Review/study/practice.
- Don’t give up.

What advice would you give to next year’s class?
- Show Mr. Wong your homework (easy marks).
- Watch Mr. Wongs videos and have a study partner for tests.
- Don’t fall behind, go in for extra help, do the review packages.
- Don’t fall behind and do the videos and bonus things because it really helps your marks.

Never be lazy.
Yes, really appreciate the bonus marks
Yes, he gives life lines and extensions
Yes, it's fair.
Yes, he was always on our side.
Yes, he helped you improve if you wanted to.
Yes, you are too kind.
Very fair, most concepts have been taught well, and the CEMC videos also helped.
Yes because he gave us a lot of chances to improve our marks and to learn better.
Was Mr. Wong Scary?

Yes because Mr. Wong bc I didn't know Mr. Wong
no because I know his teaching better.

Kinda at the beginning, I'm not sure why. By the end of the year that wore off.

Yes at the start, I felt that he may judge me if I got an answer wrong. I am not anymore.

Would you want Mr. Wong as a teacher again (also give a letter grade if you like)?

No, because I had been taught by him in the past.
Classroom Procedures for Teacher and Students
to create a positive learning environment for all!
Teacher Responsibilities

- Prepared
- Help
- Available
- Respect students
- Fun
Student Responsibilities

• Prepared
• Participate
• Responsible
• Respect
• No cell phones or computers for non-course related use
Lesson Format

• **Flipped Classroom**
  • Watch videos at home (take notes – active learning)
  • Do work in-class
  • More one-on-one time to answer questions (differentiated learning)
  • More time to check work (learn finer details to avoid deductions)
  • There are still some lectures

• **Still must follow schedule**
  • Bonus and re-tests (conditions apply, see website)
  • Less stress for you if you stay on schedule
  • If behind
    • You will get the non-multiple-choice tests
    • You will not be eligible for bonus marks or re-tests for that chapter

• **Benefits**
  • Socratic.org
Big Ideas (New Curriculum)

• Number represents and describes quantity.
• Developing computational fluency comes from a strong sense of number.
• We use patterns to represent identified regularities and form generalizations.
• We can describe measure, and compare spatial relationships.
• Analyzing data and chance helps us to compare and interpret.
Course Outline

• Chapter 1 – Polynomial Expressions and Functions
• Chapter 2 – Radical and Rational Functions
• Chapter 3 – Transforming Graphs of Functions
• Chapter 4 – Combining and Compositing Functions
• Chapter 5 – Exponential and Logarithmic Functions (getting harder)
• Chapter 6 – Trigonometry (getting harder)
• Chapter 7 – Trigonometric Equations and Identities (hard)
• Chapter 8 – Permutations and Combinations
• New Curriculum – Conics
• Semantics
• Learn to make notes
Homework (Assigned Work)

- Since in-class, we’ll say “Assigned Work”
- Assigned work is “C+” to “B”
- Challenge work is “B” to “A”
- 15% is for regular work (not challenge questions)
- 5% is for work to show in person
Assessment

- Assessment will be based on chapter tests (60%) and homework (20%).
- Tests will start with a no-calculator section.
- The final exam will be worth 20%.
- Marks will be computed on a cumulative percentage basis.
- Bonus marks and re-tests opportunities (see website).
- 2 handwritten reference sheets (4 sides) permitted on tests.
- No cell phones for tests.
- Online mark reporting.
Calculators

• Recommend TI-83+, TI-84+, Casio fx-9750, or Casio fx-9860
• Learn to use them properly, ask if you’re not sure
• Borrowing (post-dated cheque), you are responsible for the batteries
  • TI-83 - $100 deposit
  • Casio fx-9750 - $70 deposit
9. The graph of \( y = g(x) \) is the image of the graph of \( y = f(x) \) after a combination of transformations. Corresponding points are labelled. Write an equation of each image graph in terms of the function \( f \).

a) Write the equation for the image graph in the form \( y - k = af(b(x - h)) \).
   Use the points \( A(0, 9) \) and \( B(3, 0) \) on the graph of \( y = f(x) \).
   Horizontal distance between \( A \) and \( B \) is: 3
   Vertical distance between \( A \) and \( B \) is: 9
   Use corresponding points \( A'(1, -5) \) and \( B'(2, 4) \) on the graph of \( y = g(x) \).
   Horizontal distance between \( A' \) and \( B' \) is: 1
   Vertical distance between \( A' \) and \( B' \) is: 9
   The horizontal distance is one-third of the original distance, so the graph of \( y = f(x) \) is compressed horizontally by a factor of \( \frac{1}{3} \): \( b = 3 \).
   The vertical distance does not change, so the graph of \( y = f(x) \) is not compressed or stretched vertically. From the graph, there is a reflection in the \( x \)-axis, so \( a = -1 \). To determine the coordinates of \( B(3, 0) \) after this compression and reflection, substitute: \( x = 3, y = 0, a = -1 \), and \( b = 3 \) in \( \left( \frac{x}{b}, ay \right) \) to get \( \left( \frac{3}{3}, 0 \right) \), or \( (1, 0) \). Determine the translation that

b) \((-7x + 2x^4 + 13x^3) ÷ (x + 2)\)

Write the polynomial in descending order:
\( 2x^4 + 13x^3 - 7x \)
Use zeros as placeholders.
\( \frac{2x^3 + 9x^2 - 18x + 29}{x + 2} \)
\( \frac{2x^4 + 13x^3 + 0x^2 - 7x + 0}{2x^4 + 4x^3} \)
\( \frac{9x^3 + 0x^2}{9x^3 + 18x^2} \)
\( \frac{-18x^2 - 7x}{-18x^2 - 36x} \)
\( \frac{29x + 0}{29x + 58} \)
\( -58 \)
\( 2x^4 + 13x^3 - 7x = (x + 2)(2x^3 + 9x^2 - 18x + 29) - 58 \)
9. Solve, then verify each logarithmic equation.
   a) $4 = \log_2 x + \log_2(x + 6)$
   \[ x > 0 \text{ and } x > -6; \text{ so } x > 0 \]
   \[ 4 = \log_2 x(x + 6) \]
   \[ 2^4 = x(x + 6) \]
   \[ x^2 + 6x - 16 = 0 \]
   \[ (x - 2)(x + 8) = 0 \]
   \[ x = 2 \text{ or } x = -8 \]
   \[ x = -8 \text{ is extraneous.} \]
   Verify $x = 2$:
   R.S. = $\log_2 2 + \log_2 8$
   $= 1 + 3$
   $= 4$
   $= \text{L.S.}$
   The solution is verified.

   b) $\log_6 x + \log_6(x - 16) = 2$
   \[ x > 0 \text{ and } x > 16; \text{ so } x > 16 \]
   \[ \log_6 x(x - 16) = 2 \]
   \[ x(x - 16) = 6^2 \]
   \[ x^2 - 16x - 36 = 0 \]
   \[ (x - 18)(x + 2) = 0 \]
   \[ x = 18 \text{ or } x = -2 \]
   \[ x = -2 \text{ is extraneous.} \]
   Verify $x = 18$:
   L.S. = $\log_6 18 + \log_6 2$
   $= \log_6 36$
   $= 2$
   $= \text{R.S.}$
   The solution is verified.

7. A student borrows $5000 to buy a used car. The loan payments are $150 a month at 9% annual interest, compounded monthly.
   a) How long will it take the student to repay the loan?
   Use the formula: $PV = \frac{R[1 - (1 + i)^{-n}]}{i}$
   Substitute: $PV = 5000$, $R = 150$, $i = \frac{0.09}{12} = 0.0075$
   \[ 5000 = \frac{150[1 - (1 + 0.0075)^{-n}]}{0.0075} \]

   \[ \left(\frac{5000}{150}\right)(0.0075) = 1 - 1.0075^{-n} \]

   \[ 0.25 = 1 - 1.0075^{-n} \]
   \[ 1.0075^{-n} = 0.75 \]
   \[ \log 1.0075^{-n} = \log 0.75 \]
   \[ -n \log 1.0075 = \log 0.75 \]
   \[ n = \frac{\log 0.75}{-\log 1.0075} \]
   \[ n = 38.5012 \ldots \]

It will take the student approximately 39 months, or 3.25 years to repay the loan.
12. Use factoring to solve each equation over the domain $-90^\circ \leq x < 270^\circ$.

a) $2 \cos x \sin x - \cos x = 0$

$(\cos x)(2 \sin x - 1) = 0$

Either $\cos x = 0$

$x = \pm 90^\circ$

Or $2 \sin x - 1 = 0$

$\sin x = 0.5$

$x = 30^\circ$

or $x = 180^\circ - 30^\circ$

$x = 150^\circ$

The roots are: $x = 30^\circ$, $x = \pm 90^\circ$, and $x = 150^\circ$

b) $3 \tan x + \tan^2 x = 2 \tan x$

$tan x + \tan^2 x = 0$

$(\tan x)(1 + \tan x) = 0$

Either $\tan x = 0$

$x = 0^\circ$ or $x = 180^\circ$

Or $1 + \tan x = 0$

$tan x = -1$

$x = 135^\circ$ or $x = -45^\circ$

The roots are: $x = 0^\circ$, $x = 180^\circ$, $x = 135^\circ$, and $x = -45^\circ$

12. a) Prove this identity:

$$\frac{\cot \theta}{\csc \theta + 1} = \frac{\csc \theta - 1}{\cot \theta}$$

L.S. = \frac{\cot \theta}{\csc \theta + 1}

Multiply numerator and denominator by the conjugate of the denominator.

= \frac{\cot \theta \cdot (\csc \theta - 1)}{(\csc \theta + 1) \cdot (\csc \theta - 1)}

= \frac{(\cot \theta)(\csc \theta - 1)}{\csc^2 \theta - 1}

= \frac{(\cot \theta)(\csc \theta - 1)}{\cot^2 \theta}

= \frac{\csc \theta - 1}{\cot \theta}

= R.S.

Since the left side is equal to the right side, the identity is proved.
Advice for Best Results

• Attend all classes
• Don’t be late for class
• Learn to work hard
• Get at least 6 hours of sleep (7 is better), especially before a test
• Ask questions
• Participate in class discussions
Don’t be Just Another Student

- CG Scholarships and Bursaries
- Reputation
- Not just academics
- Talk to teachers
- Join clubs or teams
- Enter contests (math, physics, others)
- Not only for school
Cheating

• Copying other people’s work
• Letting other people copy your work
• Having other people do your work
• Doing other people’s work
• A mark of zero may be assigned
• Parents may be notified
• Could end up on your school record
• Could impact your ability to get scholarships and bursaries
Questions?