Algebra / Trig / Calculus I Review

Critically important: You absolutely must be able to do the following types of problems in order to succeed in this course. If you are unsure of any of these, you should study the appropriate sections in your current text or high school notes immediately. If you are still confused after reviewing the text, come to office hours and we'll be sure to get things cleared up.

1. Dividing polynomials: divide $x^4 + 2x^2 - 4x + 6$ by $x^2 + x + 3$

2. Completing the square: $x^2 + 5x - 3$

3. Writing out the unit circle, indicating the relevant angles (multiples of $\pi/6$ and $\pi/4$) on the unit circle, and the values of $\sin t$ and $\cos t$ at each of those angles.

4. Finding the list of angles where a trig function has a given value: Find all values of x for which $\cos x = \dfrac{\sqrt{3}}{2}$.

5. Writing out the (summation) definition of the definite integral of a function f from a point a to a point b, $\int_a^b f(x)\,dx$, and describing the meaning of each term in the definition.

6. Taking the derivative of any function: If $f(x) = \dfrac{\cos((2x^2 - 3)^{94})}{7x^2 \cdot \sec 6x}$, what is $f'(x)$?

7. Finding the equation of the tangent line to a given function at a given point : $f(x) = x \sin x$ where $x = \dfrac{\pi}{3}$

8. Finding basic antiderivatives: $\int \cos(x) + (x^3 - x^5)^2 \, dx$

9. Finding antiderivatives using substitution (undoing the chain rule): $\int x^2 2^{x^3} \, dx$

10. Calculating a definite integral using the Fundamental Theorem of Calculus: $\int_1^3 x^2 \, dx$

11. Evaluating limits using L'Hopital's Rule: $\lim\limits_{x \to \infty} x^{\frac{1}{x}}$