

Calculus with Analytic Geometry I (VCU Math 200 Dual Enrollment) Summer Assignment

Before embarking on the world of Calculus, it is imperative that you review your algebra skills! You must complete the problems below. There is also an accompanying link on the school website entitled "Algebra Review" that you may find handy while working out the problems.

Please bring your completed assignment on the first day of class. Make sure that your work is neat and thorough (show all your work!).

Algebra Skills

- Factoring Polynomials
- Exponent Rules
- Simplifying Rational Expressions
- Solving Equations
- *We will review graphing algebraic functions and relations on the first days of school.*

1. Factor the following expressions completely.

a. $x^3 - 1$

b. $6x^2 - 5x - 6$

c. $x^4 - 16$

d. $x^3 + 2x^2 + x$

e. $x^3 - 3x^2 - 4x + 12$

f. $x^3 - 4x^2 + 5x - 2$ (Need to use the Rational Root Theorem for polynomials!)

2. Use the Laws of Exponents to rewrite and simplify the expression without radicals or negative exponents.

a. $\frac{a^{-3}b^4}{a^{-5}b^5}$

b. $(9x^2y^4)^{3/2}$

c. $64^{-4/3}$

d. $\frac{1}{(\sqrt{t})^5}$

3. Simplify the following expressions.

a. $\frac{x^2 - 4}{x^3 - 8}$

b. $\frac{a}{bc} \div \frac{b}{ac}$

c. $u + 1 + \frac{u}{u + 1}$

d. $\frac{x}{x^2 + x - 2} - \frac{2}{x^2 - 5x + 4}$

e. $\frac{1 + \frac{1}{c - 1}}{1 - \frac{1}{c - 1}}$

4. Solve the following equations.

a. $x^2 - 2x = 8$

b. $x^2 + 9x - 1 = 0$

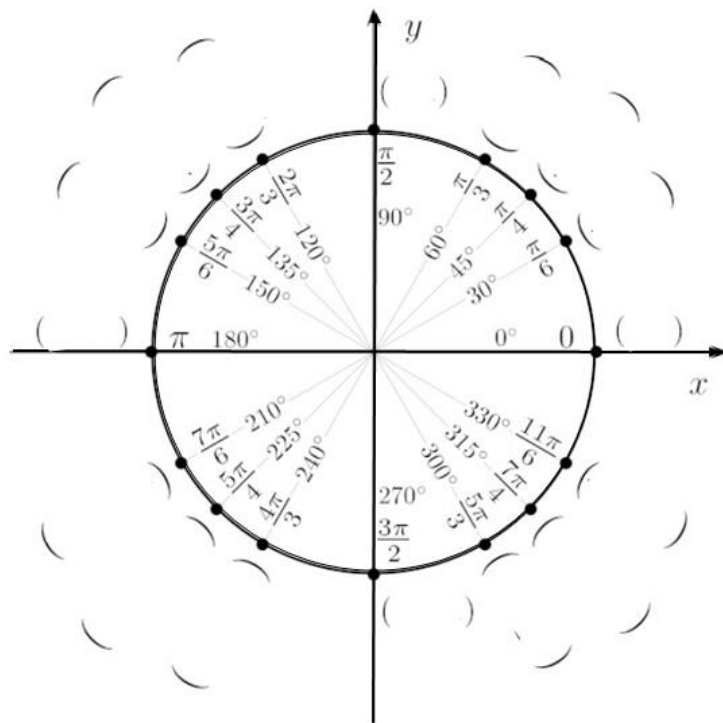
c. $x^3 - 2x + 1 = 0$ (Need to use the Rational Root Theorem for polynomials!)

d. $\frac{3}{x+5} + \frac{2}{x-1} = 1$

e. $\sqrt{4+3x} + 6 = 10$

Trigonometry Skills

- Trig Ratios of Special Angles
 - Solving Trig Equations
 - *We will review graphing Trig Functions and Identities in the first weeks of school.*
5. On the following unit circle, write the terminal point, knowing that if the radius equals one, the point will equal $(\cos \theta, \sin \theta)$.



6. Solve the following trig equations over the interval $[0, 2\pi)$.
- $\cos^2 x + \cos x = 0$
 - $\sin^2 x + 2\sin x - 3 = 0$
 - $2\sin \theta + 1 = 0$
 - $\tan(2x) = -1$