

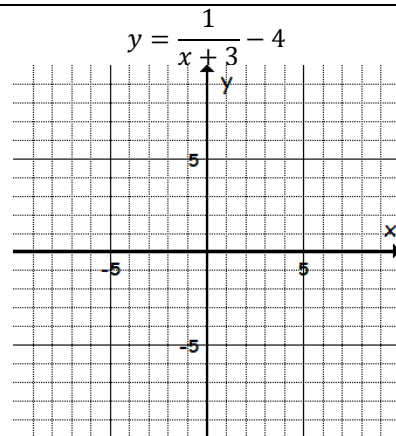
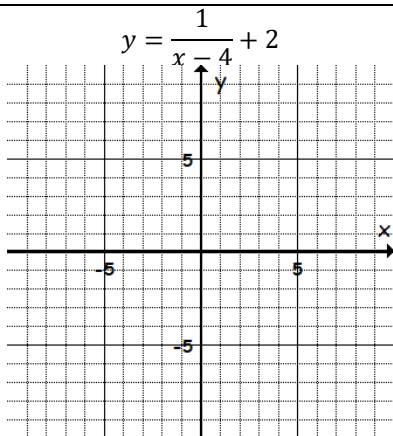
AA Sem 2 Final Exam Review

This review contains C-level problems only. It is intended to give you a head start in studying. For A and B level problems, see the group tests and reviews from those units. Those are available on my website.

Unit 5- Multiplying, Adding, Simplifying, and Graphing Rational Expressions

$$\frac{6x + 24}{x^2 - 9x + 20} \cdot \frac{x^2 - 3x - 10}{3x + 6}$$

$$\frac{x^2 + 8x + 12}{x^2 - 49} + \frac{2x + 9}{x^2 - 49}$$

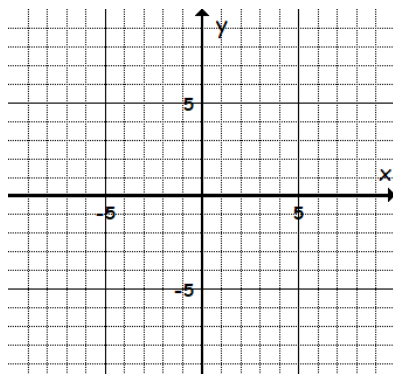


**Things to remember about Rational Expressions:**

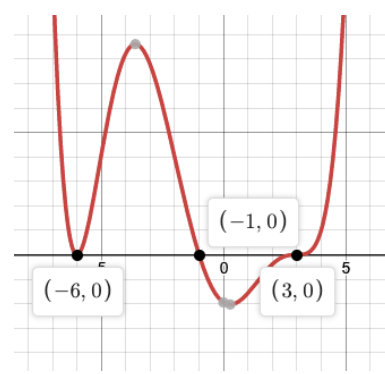
- When multiplying expressions, factor first!
- When adding or subtracting, combine like terms in the numerator (common denominator stays the same), then factor last.
- When graphing, draw asymptotes in dashed lines and label.

Unit 6- Polynomials

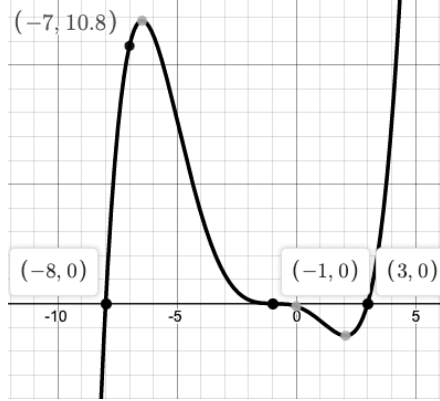
$$y = -x(x + 4)(x - 6)^3$$



Equation: \_\_\_\_\_



Exact Equation: \_\_\_\_\_



Determine if  $x = 5$  is a root of  
 $y = 2x^3 + 4x^2 - 2x + 10$

Is it a root?

Fully factor  $y = x^3 - 4x^2 - 7x + 10$  given a root at  $(-2, 0)$

Fully factor  $y = x^3 + 7x^2 - 93x - 630$  given a factor of  $(x+10)$

Partially factored: \_\_\_\_\_

Partially factored: \_\_\_\_\_

Fully factored: \_\_\_\_\_

Fully factored: \_\_\_\_\_

**Things to remember about Polynomials:**

- A root is an x-intercept; there are simple roots (exponent=\_\_\_\_), bouncing roots (exponent=\_\_\_\_), and flat roots (exponent = \_\_\_\_)
- The factor is part of the equation. If the root is substituted for x in the factor, the factor will equal zero. Factor= (x minus root)
- When factoring with the area model (box), the factor goes on the side.
- When using the Remainder Theorem, you plug the root into the equation. If you get zero, it is a root; if you get any other number, it is not.

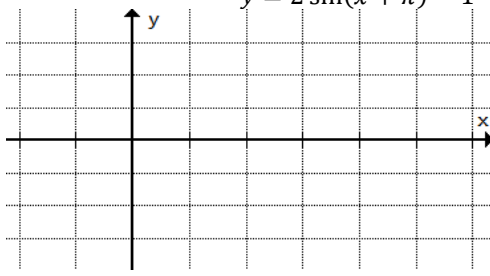
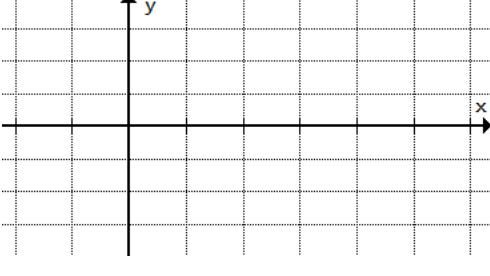
**Unit 7- Complex Numbers and Roots**

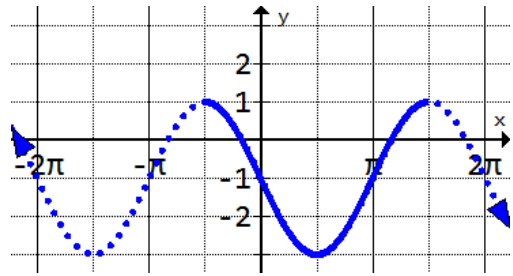
Simplify:  
 $3i - 10i$

Simplify:  
 $4i^2ii^3$

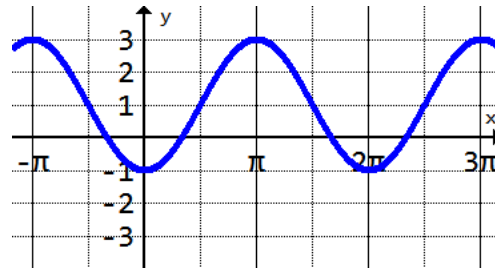
$5(2i)^2$

$(2 + 3i)(2 - 3i)$

<p>Find the equation of a quadratic with roots <math>x = \pm 3i</math></p> <p>Standard form:</p> <p>Factored form:</p>	<p>Find the equation of a quadratic with roots <math>x = 2 \pm i</math></p> <p>Standard form:</p> <p>Factored form:</p>
<p>Find the roots and factored form of: <math>y = x^2 - 8x + 20</math></p>	<p>Find the roots and factored form of: <math>y = 4x^2 + 36</math></p>
<p><b>Things to remember about Complex Numbers and Roots:</b></p> <ul style="list-style-type: none"> <li>- <math>i = \sqrt{-1}</math></li> <li>- <math>i^2 = -1</math></li> <li>- If a quadratic equation can't be factored, use the Quadratic Formula to find the roots, then write the equation. If it's an A or B level problem, watch out for the a-value.</li> <li>- Skills from Unit 6 are necessary to writing equations in this Unit.</li> </ul>	
<p>Unit 8- Trigonometry and the Unit Circle</p>	
<p>Convert to radians:</p> <p>315°</p> <p>150°</p>	<p>Convert to degrees:</p> <p><math>\frac{5\pi}{4}</math></p> <p><math>\frac{11\pi}{6}</math></p>
<p><math>\sin 315^\circ =</math></p> <p><math>\cos 150^\circ =</math></p>	<p><math>\cos \frac{5\pi}{4}</math></p> <p><math>\sin \frac{11\pi}{6}</math></p>
<p><math>y = 2 \sin(x + \pi) - 1</math></p> 	<p><math>y = -3 \cos\left(x - \frac{\pi}{2}\right) + 1</math></p> 



Equation: \_\_\_\_\_



Sine Equation \_\_\_\_\_

Cosine Equation: \_\_\_\_\_

**Things to remember about Trig and the Unit Circle:**

- How to convert between degrees and radians
- You will want a completed Unit Circle in your notes to complete AA8-1 (possibly) and AA8-2
- When graphing sine and cosine, you must scale both the axes and have five specific points graphed (one period)
- A/B level problems will include changes in period as well.

Unit 9- Statistics -- Because this is so recent, you should reference the investigations and/or assignments for practice.

**AA9-1 Sampling Methods and Bias**

Know the different types of sampling methods:

- SRS
- Stratified Random Sample
- Systematic Sample
- Cluster Sample

Know the types of bias:

- Voluntary Response
- Undercoverage
- Response
- Nonresponse

Know when a sampling method is not valid and explain why.

**AA9-2 Experiment Design**

Know the difference between an observational study and experiment.

Explanatory variable and response variable.

Factors and treatments.

**AA9-3 Z-Scores and the Normal Model**

Create a Normal Model based on a given mean and standard deviation, with the 68-95-99.7 Rule

Calculate a z-score

Find a percentage under the curve for a given value.

Estimate percentages based on the Normal Model.

**AA9-4 Sampling Distributions**

Create a sampling distribution for a proportion based on a theoretical model.

Determine the probability of a sample proportion given a sampling distribution.

For B/A- level, you should know at what point it becomes statistically significant and be able to explain why. (AA9-5)

**Things to remember about Statistics:**

- Use proper vocabulary when describing sampling methods and bias
- What we've learned is just scratching the surface; if you take a full statistics class, you'll learn a lot more detail and have a more solid background for understanding statistical significance.