Name_____

Pd_____

HW#7

Study Guide Spring Final: Pre Calculus

What you are allowed on the final: Scientific Calculator. Notes on one 8.5 by 11 size sheet of paper. ***Must be hand written*** and if you wish to have a copy of the unit circle you will have to recreate it on your notes (by hand). Law of Sines/Cosines and Trigonometric Identity equations will be provided.

A. ***Average Rate of Change***

Define: Secant Line

Define: Average Rate of Change

Find the average rate of change between x=3 and x=11 for the function $f(x) = \frac{x^2-5}{x}$

B. Inverses

Be able to find the inverse of functions including periodic functions.
Find the inverse of the following functions. Review questions from the group test.

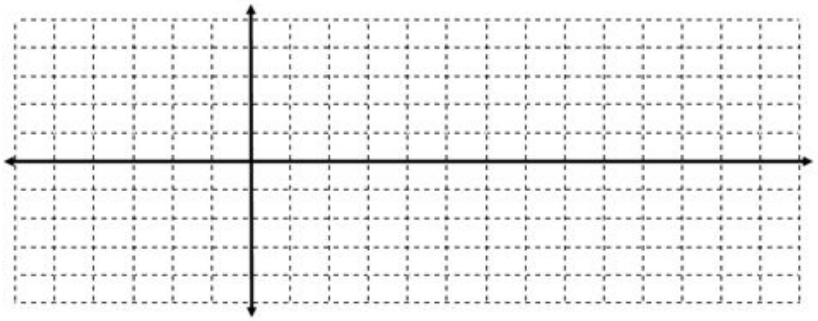
Given r(x) = $2\log_4(x - 3) + 1$, find $r^{-1}(x)$

Given $t(x) = \sqrt{x-7}$

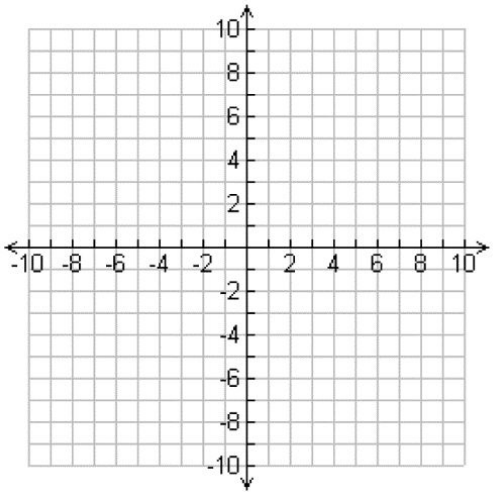
C. ***Transformations of Functions***

Review all parent graphs and how to transform them: Linear, quadratic, cubic, square root, hyperbola, exponential, logarmithic, and periodic (sine, cosine etc). Review the group test.

a. Sketch 3 periods of $f(x) = csc(x - \frac{\pi}{4}) + 3$ (*Hint: sketch* $f(x) = sin(x - \frac{\pi}{4}) + 3$ first)



b. Sketch $f(x) = 3(x-4)^2 + 1$



D. Trigonometry

a. Law of Sines and Cosines

b. Draw a sketch of any triangle and label its sides and angles. Use that triangle to write equations for the following:

What is the Law of Sines_____

What is the Law of Cosines _____

When would you use the Law of Sines vs the Law of Cosines

Review problem from The group test.

c. ***Six Trigonometric Functions***

Given $cos\theta = \frac{9}{40}$; Sketch the right triangle and determine the other 5 Trigonometric ratios.

d. ***Trig Identities***

Use sum or subtraction identities to determine the exact value of

i. $sin(75)$

ii. $sin(165)$

iii. $sin\left(\frac{-5\pi}{12}\right)$

e. ***Solving Trig Equations***

Solve the given equations on the domain $0 \le x < 2\pi$.

$\sqrt{3}\tan(x) = 3$

$4\cos(x) - 1 = 1$

f. ***Using Pythagorean Identities***

Simplify the expression $(1 - cos^2\theta)(csc\ \theta)$ to a single trigonometric function.

Simplify the expression $cos^2\theta + cos^2\theta tan^2\theta$.

E. ***Logarithms Properties***

Solve $log_2(x + 2) + log_2(3) = log_2(27)$

Solve $\frac{1}{2}ln(x^4) - ln(2x - 1) = ln(x^2) + ln(2)$

F. ***Exponent Rules***

Simplify

$$\frac{4\sqrt[5]{x^3y}}{16y^{\frac{-4}{5}}x^{\frac{8}{5}}}$$

G. ***Polynomials***

Can I divide a polynomial by a polynomial

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

Can I graph a polynomial and describes its End Behavior

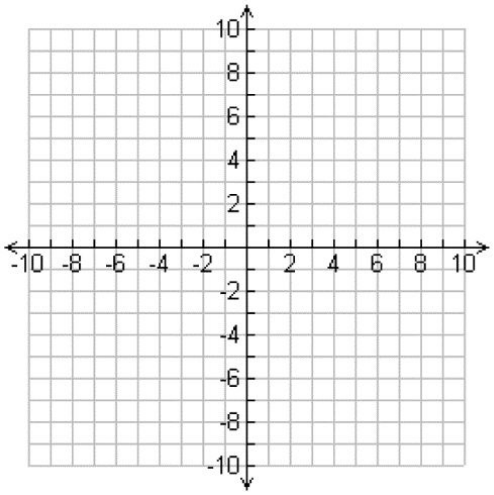
a. $f(x) = x(x-3)^2(x+3)(x-7)^5$

What is the degree of this polynomial_____

What is the degree of the factor group $(x-7)$ _____

Describe the end behavior $f(x)$

Sketch $f(x)$



H. Determining Holes and Asymptotes in Rational Functions

Given g(x) = $\frac{x+3}{x^2-9}$. State any holes and asymptotes for g(x) and graph g(x).