The final exam is comprehensive. We have covered sections 1.2, 1.4 and chapters 2, 6, 7, 8 and 9. Part of your final will be "for memory" - meaning you cannot use a calculator or card for the first part of the final, but once you turn in the first part you may use your calculator and a card on the second part.

TOPICS FOR PART 1 (No Calculator, No Card)

- Graph all six trigonometric graphs we've studied as "parent graphs" - giving 5 key points.

- Use transformations on basic trig. graphs - giving key points.

- Use transformations to graph algebraic functions - label at least 3 points.

- Know the basic trig. identities/equations: SOHCAHTOA, reciprocals, Pythagorean Identities, Sum and Difference Formulas, Law of Sines, Law of Cosines.

- Know the key values on the unit circle.

TOPICS FOR PART 2 (Card and Calculator OK)

- Determine if functions are odd, even or neither.

- Find the equation of a circle given information about that circle.

- Combine functions and determine domain and range.

- Apply the difference quotient to a function.

- Develop mathematical models.

- Solve Trigonometric Equations.

- Write trigonometric expressions in algebraic form.

- Find values of inverse trigonometric expressions.

- Establish trigonometric identities.

- Find sides and angles of triangles (right or non-right triangles).

- Identify and graph with polar equations (especially lines, circles and all types of limacons).

- Convert equations in polar form to rectangular form and vice-versa.

- Convert complex numbers into polar form and into standard form from polar form.

- Operate on complex numbers ($\times$, $\div$, powers and roots)

- Find magnitudes of vectors.

- Find the angle between two vectors.

- Find dot products and cross products of vectors.

- Solve application problems involving the following:

  1. Mathematical Modeling
  2. Areas of circles (and sectors and segments)
  3. Right-triangle trigonometry
  4. Non-right triangles (Laws of Sines and Cosines)
  5. Vectors

The above constitutes a list of topics that may show up on the final. If I am able to do so, I will pull together some practice problems for you, but do remember that you have many resources, and remember to be a resourceful student! (Being resourceful is a major source of current and future success!!) Remember that you have 3 tests that have been graded and returned to you (as well as fully worked keys for those tests) - quizzes you've taken on MyMathLab - other resources on MyMathLab - and Chapter Review and Chapter Tests at the end of each chapter in your book (WITH ANSWERS in the back!). Be sure to make use of the information I've provided you here and of the resources that you have!

PRACTICE PROBLEMS

1. Given $f(x) = \dfrac{2x^2}{x^4 + 1}$, what is the domain? Is the function even, odd, or neither? [2.3]

2. Find the equation of a circle with center $(-1, 3)$ tangent to the line $y = 2$ [1.4]

3. Given that $f(x) = \sqrt{3 - x}$ and $g(x) = \dfrac{2}{x}$ Find $(f + g)(x)$ and $\dfrac{f}{g}(x)$ and give the domain for each. [2.1]

4. Find the difference quotient for $f(x) = 2x - 3$. [2.1] Recall that the difference quotient is $\dfrac{f(x + h) - f(x)}{h}$

5. Find the difference quotient for $f(x) = x^2 + 5x - 2$. [2.1]

6. Find the difference quotient for $f(x) = x^3$. [2.1]

7. Find the difference quotient for $f(x) = \dfrac{1}{x}$. [7.3]

8. Solve on the interval $[0, 2\pi)$: $2\cos^2\theta + \cos\theta = 0$. [7.3]

9. Solve on the interval $[0, 2\pi)$: $\cos^2\theta + \sin\theta = \sin^2\theta$. [7.3]

10. Solve on the interval $[0, 2\pi)$: $\csc^2\theta = \cot\theta + 1$. [7.3]

11. Write $\cos\left(\tan^{-1} u\right)$ as an algebraic expression in u. [7.2]

12. Write $\tan\left(\sin^{-1} u\right)$ as an algebraic expression in u. [7.2]

13. Find the exact value of $\cos\left(\sin^{-1}\dfrac{\sqrt{2}}{2}\right)$ [7.2]

14. Find the exact value of $\sin\left(\tan^{-1} -3\right)$ [7.2]

15. Use identities to establish that $\sin(2\theta) = 2\sin\theta\cos\theta$ [7.4 & 7.5]

16. Use identities to establish that $\dfrac{\cos^2\theta - \sin^2\theta}{1 - \tan^2\theta} = \cos^2\theta$ [7.4]