4. Do WebAssign 7.4a. Remember that the WebAssign will be reopened three days before Exam I for you to review the problems. You will be allowed to improve your score by a maximum of three points. However, additional attempts on the problems will not be given.

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5. Use polynomial division to re-write
$\dfrac{x^4+12x^3+15x^2+25x+11}{x^3+12x^2+11x}$

Factorize the expression x^3+12x^2+11x

Use your answers above to split the expression into partial fractions.
$\dfrac{x^4+12x^3+15x^2+25x+11}{x^3+12x^2+11x}$

Use you work above to find the antiderivative of
$\displaystyle\int \frac{x^4+12x^3+15x^2+25x+11}{x^3+12x^2+11x}\,dx.$

6. Find the zeros of the function $y=x^3-3x+4$and use your answer to factorize x^3-3x^2+4

Split the expression into partial fractions.
$\dfrac{3(x-5)}{x^3-3x^2+4}$

Use your answer to find the antiderivative of
$\displaystyle\int \frac{3x-15}{(x+1)(x-2)^2}\,dx.$

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7. Complete the square and compute the integral
$\displaystyle\int \frac{1}{\sqrt{2z-z^2}}\,dz.$

Trig Identities

Section 7.4b
September 6, 2016

Name:
Math 129 - 01

Review	Be able to use triangles to simplify expressions like $\cos\left(\arcsin\left(\frac{a}{b}\right)\right)$.
Understand	Know that an integral containing $\sqrt{a^2 - x^2}$ may be solved by the substitution $x = a\sin(\theta)$.
Understand	Know that an integral containing $a^2 + x^2$ may be solved by the substitution $x = a\tan(\theta)$.
Understand	Use algebra and the Pythagorean Theorem to simplify an integrand after trig substitution.
Apply	Solve integrals which have the right form using trig substitution.
Apply	Correctly handle changing limits of integration in trig substitutions on definite integrals.
Synthesize	Use algebra to put more complex integrals into a form ready for trig substitution.

1. Use the substitution $x = \frac{5}{2}\sin(t)$ to show that

$$\frac{1}{\sqrt{25 - 4x^2}} = \frac{1}{5\cos(t)}.$$

2. Dr. Jillian Holtzman suggests that using the substitution $t = 3\tan(\theta)$ can be used to solve the integral $\int(9 + t^2)^{-1/2}dt$. Do you agree or disagree with her? Back up your position with an argument.

3. Give a substitution which could be used to compute the following integrals:

$$\int \frac{x}{\sqrt{x^2 + 9}}dx \qquad \int \frac{1}{\sqrt{x^2 + 9}}dx.$$

Quiz (Leave this space blank)