Math 274 Prereq Expectations

In order to be successful in this class, in particular on exams, you should know the following. This is not a complete list, but rather some of the most important things to have in your toolbox.

1. Exact values for sine, cosine, and tangent for angles that are multiples of $\pi/6$ or $\pi/4$.
2. Exact values for the inverse trigonometric functions corresponding to the angles above.
3. Basic properties of exponentials and logarithms.
   (a) $e^{x+y} = e^x e^y$
   (b) $(e^x)^y = e^{xy}$
   (c) $e^0 = 1$
   (d) $e^{\ln x} = x$
   (e) $\ln(xy) = \ln x + \ln y$
   (f) $\ln(x/y) = \ln x - \ln y$
   (g) $\ln(x^n) = n \ln x$
   (h) $\ln(e^x) = x$
4. Basic rules of differentiation, including implicit differentiation.
5. The Fundamental Theorem of Calculus, both parts.
6. Basic rules of Integration.
   (a) $\displaystyle\int (af(x) + bg(x))\,dx = a\int f(x)\,dx + b\int g(x)\,dx$
   (b) $\displaystyle\int x^n\,dx = \frac{x^{n+1}}{n+1} + c$, for $n \neq -1$
   (c) $\displaystyle\int \frac{dx}{x} = \ln|x| + c$
   (d) $\displaystyle\int e^x\,dx = e^x + c$
   (e) $\displaystyle\int \sin x\,dx = -\cos x + c$
   (f) $\displaystyle\int \cos x\,dx = \sin x + c$
   (g) $\displaystyle\int \sec^2 x\,dx = \tan x + c$
   (h) $\displaystyle\int \tan x\,dx = \ln|\sec x| + c$
   (i) $\displaystyle\int \frac{dx}{1+x^2} = \arctan x + c$
7. Basic techniques of integration.
   (a) Substitution (b) Integration by parts (c) Partial fractions
8. Additional techniques of integration will be required for the course exercises.