Short quiz 1 info:

There will be a 3-question, 10-minute quiz at the start of class on Monday. Be ready for 3 integrals that are all kind of like this:

$\int \sin(4x)dx \quad \int e^{3x+1}dx \quad \int \frac{1}{2-5x}dx \quad \int \frac{1}{1+(3x)^2}dx$

At least one will have an easy variation like this:

$\int 5\sin(4x)dx \quad \int 6e^{3x+1}dx \quad \int \frac{8}{2-5x}dx \quad \int \frac{4}{1+(3x)^2}dx$

And one will probably have a tricky, but easy, variation like this:

$\int \ln(3)\sin(4x)dx \quad \int \pi e^{3x+1}dx \quad \int \frac{e^2}{2-5x}dx \quad \int \frac{\sqrt{2}+1}{1+(3x)^2}dx$

All of the integrals can be found by making a substitution where *u'* is just a constant:

$\int \sin(4x)dx$ $u=4x$ $du=4dx$ $dx=\frac{1}{4}du$ $\int \sin(u)\frac{1}{4}du=$ $-\frac{1}{4}\cos(u)+C$ $=-\frac{1}{4}\cos(4x)+C$	$\int e^{3x+1}dx$ $u=3x+1$ $du=3dx$ $dx=\frac{1}{3}du$ $\int e^u\frac{1}{3}du=\frac{1}{3}e^u+C$ $=\frac{1}{3}e^{3x+1}+C$	$\int \frac{1}{2-5x}dx$ $u=2-5x$ $du=-5dx$ $dx=\frac{-1}{5}du$ $\int \frac{1}{u}\left(-\frac{1}{5}\right)du$ $=-\frac{1}{5}\ln\lvert u\rvert+C$ $=-\frac{1}{5}\ln\lvert 3x+1\rvert+C$	$\int \frac{1}{1+(3x)^2}dx$ $u=3x$ $du=3dx$ $dx=\frac{1}{3}du$ $\int \frac{1}{1+u^2}\frac{1}{3}du$ $=\frac{1}{3}\tan^{-1}u+C$ $=\frac{1}{3}\tan^{-1}(3x)+C$

You don't need to memorize the derivatives of the inverse trig functions (they'll be written out in case you need them).

You do need to practice how to do integrals with this kind of substitution (you should be doing some of these as part of your homework assignment—watch for them as a step in doing #3, 5 and 23)

You do need to look for constants, and know what to do with them. Even the tricky ones are just multiplied by a constant:

$\int \ln(3)\sin(4x)dx$ $=\ln(3)\int \sin(4x)dx$	$\int \pi e^{3x+1}dx$ $=\pi\int e^{3x+1}dx$	$\int \frac{e^2}{2-5x}dx$ $=e^2\int \frac{1}{2-5x}dx$	$\int \frac{\sqrt{2}+1}{1+(3x)^2}dx=$ $(\sqrt{2}+1)\int \frac{1}{1+(3x)^2}dx$

constants