

On the exam there will be a collection of formulas. In a problem where you are asked to evaluate an integral, you may directly use those formulas. If the function you are asked to integrate does not directly fit those formulas, you must show all work needed to do the integral using those formulas together with substitution and the techniques studied in chapter seven of the text. Do not simply quote some other formula and “plug in” the function. In particular, since you are allowed to bring in some notes among which you might include formulas of this sort, be sure you can do the integral problems in this way!

The formulas which will appear on the exam are given below, so that you can see what you will have available and what you are allowed to use on the exam.

Some formulas, identities, and numeric values you might find useful:

Values of trig functions:

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$
0	0	1	0
$\frac{\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
$\frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
$\frac{\pi}{2}$	1	0	—

Trig facts:

1. $\tan \theta = \frac{\sin \theta}{\cos \theta}$
2. $\sec \theta = \frac{1}{\cos \theta}$
3. $\sin^2 \theta + \cos^2 \theta = 1$
4. $\sec^2 \theta = \tan^2 \theta + 1$
5. $\sin(x + y) = \sin(x) \cos(y) + \cos(x) \sin(y)$
6. $\cos(x + y) = \cos(x) \cos(y) - \sin(x) \sin(y)$
7. $\tan(x + y) = \frac{\tan(x) + \tan(y)}{1 - \tan(x) \tan(y)}$
8. $\sin^2 x = \frac{1}{2}(1 - \cos 2x)$
9. $\cos^2 x = \frac{1}{2}(1 + \cos 2x)$

Derivative formulas:

1. $\frac{d}{dx} \tan x = \sec^2 x$
2. $\frac{d}{dx} \sec x = \sec x \tan x$
3. $\frac{d}{dx} \sin^{-1} x = \frac{1}{\sqrt{1-x^2}}$

4. $\frac{d}{dx} \tan^{-1} x = \frac{1}{1+x^2}$
5. $\frac{d}{dx} \sec^{-1} x = \frac{1}{|x|\sqrt{x^2-1}}$
6. $\frac{d}{dx} \ln x = \frac{1}{x}$
7. $\frac{d}{dx} e^x = e^x$

Integral formulas:

1. $\int u^n du = \frac{1}{n+1} u^{n+1} + C$, if $n \neq -1$
2. $\int \frac{1}{u} du = \ln |u| + C$
3. $\int \frac{du}{\sqrt{1-u^2}} = \sin^{-1} u + C$
4. $\int \frac{du}{1+u^2} = \tan^{-1} u + C$
5. $\int \sec(u) du = \ln |\sec(u) + \tan(u)| + C$
6. $\int u dv = uv - \int v du$

Algebra formulas:

1. $\ln(xy) = \ln(x) + \ln(y)$
2. $a^{x+y} = a^x a^y$
3. $a^b = e^{b \ln a}$