Instructions: For each group (groups are separated by horizontal lines), match term or quantity in left column to descriptions that apply from the numbered columns. There may be more than one match that is possible, and you might not use all the numbered items in each group.

Antidifferentiation __4__

Derivative dy/dx __7__

Antiderivative __3__

Differentiation __2__

Constant of Integration __6__

Differential __5__

Family of Curves __1__

1. This quantity involves a constant, usually something like $g(x)+C$ (although other forms are possible), and when you assign different values to the constant C you get different curves.
2. The process of finding the derivative of a function $f(x)$.
3. A family of curves.
4. The process of finding an antiderivative of a function $f(x)$.
5. Informally, this quantity can be written as dx and represents a small amount of x.
6. This quantity is included when an antidifferentiation is performed.
7. This quantity represents the instantaneous rate of change of y with respect to the variable x.

Integration __2__

Definite Integral __7__

Indefinite Integral __1__

Improper Integral __3__

Integral __5__

Limits of Integration __6__

Integrand __4__

FTC Part 1: $\dfrac{d}{dx}\displaystyle\int_a^x w(t)\,dt =$ __8__

FTC Part 2: $\displaystyle\int_a^b \frac{d}{dx}[w(x)]\,dx =$ __9__

1. Formally, this quantity looks like $\displaystyle\int f(x)\,dx$. When evaluated it yields a family of curves as the solution.
2. The process of evaluating an integral (definite, indefinite, or improper) of a function $f(x)$.
3. Formally, this quantity looks like $\displaystyle\int_a^b f(x)\,dx$ where the integrand $f(x)$ is infinite for some $x \in [a,b]$, or $a \to -\infty$ or $b \to \infty$.
4. For $\displaystyle\int_a^b f(x)\,dx$, this quantity is $f(x)$.
5. Used as a way to refer to any of the specific types of integrals.
6. For $\displaystyle\int_a^b f(x)\,dx$, this quantity is a and b.
7. Formally, this quantity looks like $\displaystyle\int_a^b f(x)\,dx$. When evaluated it yields a number.
8. $w(x)$
9. $w(b)-w(a)$

$e^{x+y} =$ __2__

$\ln(e^x - e^y) =$ __5__

$\ln(e^{x-y}) =$ __3__

1. $e^x + e^y$
2. $e^x e^y$
3. $x - y$
4. x/y
5. $\ln(e^x - e^y)$

$\frac{d}{dx}\left[\frac{f(x)}{g(x)}\right] =$ __5__

$\frac{d}{dx}\left[f(x)g(x)\right] =$ __10__

$\frac{d}{dx}\left[f(g(x))\right] =$ __3__

1. $f'(g(x))$
2. $f(g'(x))$
3. $f'(g(x))g'(x)$
4. $f'(g'(x))g'(x)$
5. $\dfrac{g(x)f'(x) - f(x)g'(x)}{(g(x))^2}$
6. $\dfrac{g(x)f'(x) - f(x)g'(x)}{g(x)}$
7. $\dfrac{g'(x)f'(x) - f(x)g(x)}{(g(x))^2}$
8. $\dfrac{g(x)f'(x) + f(x)g'(x)}{(g(x))^2}$
9. $f'(x)g'(x)$
10. $f'(x)g(x) + f(x)g'(x)$
11. $f(x)g(x)$
12. $g(x)$

$\frac{d}{dx}\sin x =$ __2__

$\frac{d}{dx}\tan x =$ __6__

$\frac{d}{dx}\cos x =$ __3__

$\frac{d}{dx}\csc x =$ __13__

$\frac{d}{dx}\sec x =$ __10__

$\frac{d}{dx}\cot x =$ __9__

$\frac{d}{dx}\arctan x =$ __16__

$\frac{d}{dx}\arcsin x =$ __15__

$\frac{d}{dx}e^x =$ __18__

$\frac{d}{dx}x^n =$ __21__

$\frac{d}{dx}\ln|x| =$ __22__

1. $\sin x$
2. $\cos x$
3. $-\sin x$
4. $-\cos x$
5. $\sec x$
6. $\sec^2 x$
7. $-\sec^2 x$
8. $\csc^2 x$
9. $-\csc^2 x$
10. $\sec x \tan x$
11. $\csc x \tan x$
12. $\csc x \cot x$
13. $-\csc x \cot x$
14. $\dfrac{1}{\sqrt{1+x^2}}$
15. $\dfrac{1}{\sqrt{1-x^2}}$
16. $\dfrac{1}{1+x^2}$
17. xe^{x-1}
18. e^x
19. $\dfrac{1}{n+1}x^{n+1}$
20. $\dfrac{1}{n-1}x^{n-1}$
21. nx^{n-1}
22. $\dfrac{1}{x}$
23. $\dfrac{1}{|x|}$

$\cos^2 x + \sin^2 x =$ __1__

$\sin(x+y) =$ __4__

$\cos(x+y) =$ __5__

$1 + \cot^2 x =$ __3__

$\sin(2x) =$ __2__

$\cos^2 x =$ __7__

$\sin^2 x =$ __6__

$\cos 2x =$ __8__

$\cos x \cos y =$ __9__

1. 1
2. $2\sin x \cos x$
3. $\csc^2 x$
4. $\sin x \cos y + \cos x \sin y$
5. $\cos x \cos y - \sin x \sin y$
6. $\dfrac{1}{2}(1 - \cos 2x)$
7. $\dfrac{1}{2}(1 + \cos 2x)$
8. $\cos^2 x - \sin^2 x$
9. $\dfrac{1}{2}\Big(\cos(x-y) + \cos(x+y)\Big)$