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 _____

Derivative dy/dx _____

Antiderivative _____

Differentiation _____

Constant of Integration _____

Differential _____

Family of Curves _____

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 _____

Definite Integral _____

Indefinite Integral _____

Improper Integral _____

Integral _____

Limits of Integration _____

Integrand _____

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

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

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. $w(b) - w(a)$

$e^{x+y} =$ _____

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

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

1. $e^x + e^y$

2. $e^x e^y$

3. $x - y$

4. x/y

5. $\ln(e^x - e^y)$

$$\frac{d}{dx}\left[\frac{f(x)}{g(x)}\right] = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}\left[f(x)g(x)\right] = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}\left[f(g(x))\right] = \underline{\hspace{1cm}}$$

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. $g(x)$

$$\frac{d}{dx}\sin x = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}\tan x = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}\cos x = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}\csc x = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}\sec x = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}\cot x = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}\arctan x = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}\arcsin x = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}e^x = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}x^n = \underline{\hspace{1cm}}$$

$$\frac{d}{dx}\ln|x| = \underline{\hspace{1cm}}$$

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. $\dfrac{1}{|x|}$

$$\cos^2 x + \sin^2 x = \underline{\hspace{1cm}}$$

$$\sin(x+y) = \underline{\hspace{1cm}}$$

$$\cos(x+y) = \underline{\hspace{1cm}}$$

$$1 + \cot^2 x = \underline{\hspace{1cm}}$$

$$\sin(2x) = \underline{\hspace{1cm}}$$

$$\cos^2 x = \underline{\hspace{1cm}}$$

$$\sin^2 x = \underline{\hspace{1cm}}$$

$$\cos 2x = \underline{\hspace{1cm}}$$

$$\cos x \cos y = \underline{\hspace{1cm}}$$

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. $\dfrac{1}{2}\Big(\cos(x-y) + \cos(x+y)\Big)$