

## Review from First Semester Calculus

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*1-6 State the definition for each of the following*

1. The function  $f(x)$  is continuous at  $c$
3. The derivative of  $f(x)$  with respect to  $x$  in terms of a limit:
4. The definite integral of  $f(x)$  on  $[a,b]$  in terms of a limit:
5. The indefinite integral of  $f(x)$ :

6.  $\ln(x)$  in terms of an integral:

$$\ln(x) =$$

7. The average of  $f(x)$  on the interval  $[a,b]$ :

8. State the Fundamental Theorem of Calculus:

9. If  $y = f(x)$  then

$$dy =$$

10. If  $y = f(x)$  then the standard linearization of  $y$  at  $x=a$  is the tangent line function:

$$L(x) =$$

$$11. \int x^n dx =$$

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$$12. \int \sin(x) dx =$$

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$$13. \int \cos(x) dx =$$

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$$14. \int \frac{1}{x} dx =$$

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$$15. \int e^x dx =$$

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$$16. \frac{d}{dx} x^n =$$

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$$17. \frac{d}{dx} \sin(x) =$$

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$$18. \frac{d}{dx} \cos(x) =$$

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$$19. \frac{d}{dx} \tan(x) =$$

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$$20. \frac{d}{dx} \sec(x) =$$

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$$21. \frac{d}{dx} \ln(x) =$$

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$$22. \frac{d}{dx} e^x =$$

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$$23. d(y^n) =$$

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$$24. d(\sin(\theta)) =$$

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$$25. d(\cos(z)) =$$

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$$26. d(\tan(\psi)) =$$

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$$27. d(\sec(x)) =$$

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$$28. d(\ln(u)) =$$

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$$29. d(e^x) =$$

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$$30. d(3\pi^2) =$$

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**31-35 Integrate the following:**

31.  $\int \tan^3(x) \sec^2(x) dx$

32.  $\int (\sin^3(x) + 1) \cos(x) dx$

33.  $\int \frac{t^2 + 2t + 1}{\sqrt{t + 2}} dt$

34.  $\int e^{\sin(x)} \cos(x) dx$

35.  $\int_1^2 \frac{2x + 1}{x^2 + x} dx$