

Ws 1 - Usubstitution
Calculus AB

1. $\int (1+2x)^4 (2)dx$

2. $\int (x^2-9)^3 (2x)dx$

3. $\int \sqrt{9-x^2} (-2x)dx$

4. $\int \sqrt[3]{1-2x^2} (-4x)dx$

5. $\int x^3 (x^4+3)^2 dx$

6. $\int x(4x^2+3)^3 dx$

7. $\int t\sqrt{t^2+2} dt$

8. $\int t^3\sqrt{t^4+5} dt$

9. $\int 5x\sqrt[3]{1-x^2} dx$

10. $\int u^2\sqrt{u^3+2} du$

11. $\int \frac{x}{(1-x^2)^3} dx$

12. $\int \frac{x^3}{(1+x^4)^2} dx$

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

Solve the differential equations.

14. $\frac{dy}{dx} = \frac{10x^2}{\sqrt{1+x^3}}$

15. $\frac{dy}{dx} = \frac{x+1}{(x^2+2x-3)^2}$

Integrate each.

16. $\int \pi \sin \pi x dx$

19. $\int \cos 6x dx$

17. $\int 4x^3 \sin x^4 dx$

20. $\int \frac{1}{\theta^2} \cos \frac{1}{\theta} d\theta$

18. $\int \sin 2x dx$

21. $\int x \sin x^2 dx$

Recall:

22. At what value of x is the tangent line to $f(x)=2x^2-8x$ is parallel to the line $2x-3y=2$.

23. Name the equation of the tangent line to $f(x)=\frac{x^2+1}{x+2}$ when $x = -1$.

24. Find $\frac{dy}{dx}$ for $2xy-3x^2y-3=0$.

ANSWERS

1. $\frac{1}{5}(1+2x)^5 + C$

2. $\frac{1}{4}(x^2-9)^4 + C$

3. $\frac{2}{3}(9-x^2)^{3/2} + C$

4. $\frac{3}{4}(1-2x^2)^{4/3} + C$

5. $\frac{(x^4+3)^3}{12} + C$

6. $\frac{(4x^2+3)^4}{32} + C$

7. $\frac{1}{3}(t^2+2)^{3/2} + C$

8. $\frac{1}{6}(t^4+5)^{3/2} + C$

9. $\frac{-15(1-x^2)^{4/3}}{8} + C$

10. $\frac{2(u^3+2)^{3/2}}{9} + C$

11. $\frac{1}{4(1-x^2)^2} + C$

12. $\frac{-1}{4(1+x^4)} + C$

13. $t^{3/2}\left(\frac{4}{5}t + \frac{2}{3}\right) + C$

14. $y = \frac{20}{3}\sqrt{1+x^3}$

15. $y = \frac{-1}{2(x^2+2x-3)} + C$

16. $-\cos \pi x + C$

17. $-\cos x^4 + C$

18. $-\frac{1}{2}\cos 2x + C$

19. $\frac{1}{6}\sin 6x + C$

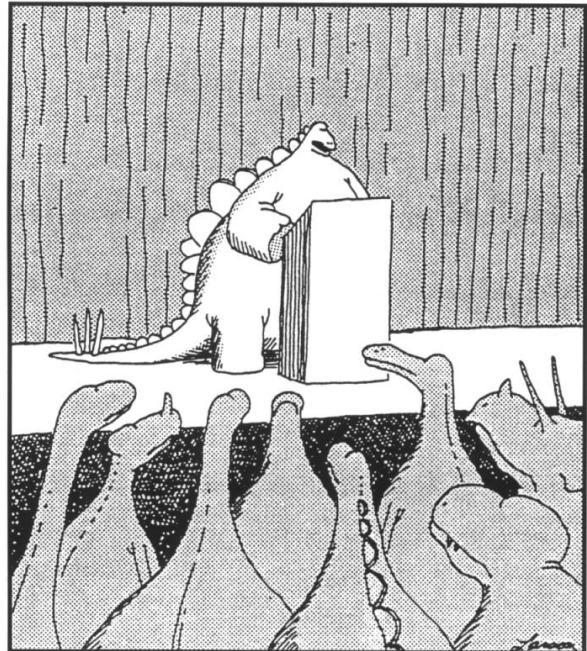
20. $-\sin \frac{1}{\theta} + C$

21. $-\frac{1}{2}\cos x^2 + C$

22. $13/6$

23. $y-2 = -4(x+1)$

24. $\frac{dy}{dx} = \frac{6xy-2y}{2x-3x^2}$



"The picture's pretty bleak, gentlemen. ... The world's climates are changing, the mammals are taking over, and we all have a brain about the size of a walnut."