p. 331 #1-19 odd

1. $\frac{dy}{dx} = 5x^4 - \sec^2 x$

$y = x^5 - \tan x + C$

2. $\frac{dy}{dx} = \sin x - e^{-x} + 8x^3$

$y = -\cos x + e^{-x} + 2x^4 + C$

5. $\frac{dy}{dx} = 5^x \ln 5 + \frac{1}{x^2+1}$

$y = 5^x + \tan^{-1} x + C$

7. $\frac{ds}{dt} = 3t^2 \cos(t^3)$

$s = \sin t^3 + C$

9. $\frac{du}{dx} = (\sec^2 x^5)(5x^4)$

$u = \tan x^5 + C$

11. $\frac{dy}{dx} = 3\sin x \quad y = 2 \text{ when } x = 0$

$\int dy = \int 3\sin x \, dx$

$y = -3\cos x + C$

$2 = -3 + C$

$\boxed{y = -3\cos x + 5}$

13. $\frac{du}{dx} = 7x^6 - 3x^2 + 5 \quad u = 1 \quad x = 1$

$\int du = \int 7x^6 - 3x^2 + 5 \, dx$

$u = x^7 - x^3 + 5x + C$

$1 = 1 - 1 + 5 + C$

$-4 = C$

$\boxed{u = x^7 - x^3 + 5x - 4}$

15. $\frac{dy}{dx} = -\frac{1}{x^2} - \frac{3}{x^4} + 12 \quad y = 3 \quad x = 1$

$\int dy = -x^{-2} - 3x^{-4} + 12 \, dx$

$y = x^{-1} + x^{-3} + 12x + C$

$3 = 1 + 1 + 12 + C$

$-11 = C$

$\boxed{y = x^{-1} + x^{-3} + 12x - 11}$

17. $\frac{dy}{dt} = \frac{1}{1+t^2} + 2^t \ln 2 \quad y = 3 \quad t = 0$

$\int dy = \int \frac{1}{1+t^2} + 2^t \ln 2 \, dt$

$y = \tan^{-1} t + 2^t + C$

$3 = 0 + 1 + C$

$\boxed{y = \tan^{-1} t + 2^t + 2}$

19. $\frac{dv}{dt} = 4\sec t \tan t + e^t + 6t \quad v = 5 \quad t = 0$

$\int dv = \int 4\sec t \tan t + e^t + 6t \, dt$

$v = 4\sec t + e^t + 3t^2 + C$

$5 = 4 + 1 + C$

$0 = C$

$\boxed{v = 4\sec t + e^t + 3t^2}$

20. $\frac{ds}{dt} = 3t^2 - 2t$

$\int ds = 3t^2 - 2t \, dt$

$s = t^3 - t^2 + C$

$0 = 1 - 1 + C$

$0 = C$

$\boxed{s = t^3 - t^2}$

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p. 331 #2-20 even

2. $\frac{dy}{dx} = \sec x \tan x - e^x$

$y = \sec x - e^x + C$

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

$y = \ln x + x^{-1} + C$

8. $\frac{dy}{dt} = (\cos t)e^{\sin t}$

$y = e^{\sin t} + C$

10. $\frac{dy}{du} = 4(\sin u)^3(\cos u)$

$y = (\sin u)^4 + C$

12. $\frac{dy}{dx} = 2e^x - \cos x \quad y=3 \quad x=0$

$\int dy = \int 2e^x - \cos x \, dx$

$y = 2e^x - \sin x + C$

$3 = 2 - 0 + C$

$1 = C$

$\boxed{y = 2e^x - \sin x + 1}$

14. $\frac{dA}{dx} = 10x^9 + 5x^4 - 2x + 4 \quad A=6 \quad x=1$

$\int dA = \int 10x^9 + 5x^4 - 2x + 4$

$A = x^{10} + x^5 - x^2 + 4x + C$

$6 = 1 + 1 - 1 + 4 + C$

$1 = C$

$\boxed{A = x^{10} + x^5 - x^2 + 4x + 1}$

16. $\frac{dy}{dx} = 5\sec^2 x - \frac{3}{2}\sqrt{x} \quad y=7 \quad x=0$

$\int dy = \int 5\sec^2 x - \frac{3}{2}x^{\frac{1}{2}}$

$y = 5\tan x - x^{3/2} + C$

$7 = C$ $\boxed{y = 5\tan x - x^{3/2} + 7}$

18. $\frac{dx}{dt} = \frac{1}{t} - \frac{1}{t^2} + 6 \quad x=0 \quad t=1$

$\int dx = \int \frac{1}{t} - t^{-2} + 6 \, dt$

$x = \ln t + t^{-1} + 6t + C$

$0 = 0 + 1 + 6 + C$

$-7 = C$ $\boxed{x = \ln t + \frac{1}{t} + 6t - 7}$

20. $\frac{ds}{dt} = 3t^2 - 2t \quad t=1 \quad s=0$

$\int ds = \int 3t^2 - 2t \, dt$

$s = t^3 - t^2 + C$

$0 = 1 - 1 + C$

$0 = C$

$\boxed{s = t^3 - t^2}$

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