$\boxed{\text{Assignment \# 9 PART A - NYA ELECTRO SOLUTIONS}}$

Edition 9

P. 737 # 5, 7, 9, 11

P. 741 # 5, 7, 9, 11, 13, 15, 17, 19, 21, 23

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Edition 8

P. 735 # 5, 7, 9, 11

P. 740 # 5, 7, 9, 11, 13, 15, 17, 19, 21, 23

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\# 5 $f(x) = 3x^2 \quad F(x) = ax^3$

$$\int f(x)\,dx = x^3 + C$$

so $ax^3 = x^3$

$\boxed{a = 1}$

\# 7 $f(x) = 18x^5 \quad F(x) = ax^6$

$$\int 18x^5\,dx = 18\frac{x^6}{6} + C$$

so $\frac{18x^6}{6} = ax^6$

$\boxed{a = 18/6 = 3}$

\# 9 $f(x) = 9\sqrt{x} \quad F(x) = ax^{3/2}$

$$\int 9\sqrt{x}\,dx = \frac{9x^{3/2}}{3/2} + C$$

so $\frac{9x^{3/2}}{3/2} = ax^{3/2}$

$9 \cdot 2/3 = a$

$\boxed{a = 6}$

\# 11 $f(x) = 1/x^2 \quad F(x) = a/x$

$$\int 1/x^2\,dx = \int x^{-2}\,dx = \frac{x^{-1}}{-1} + C$$

$-\frac{1}{x} = \frac{a}{x} \quad \boxed{a = -1}$

p. 741 #5 $\int 2x\,dx = \boxed{x^2 + C}$

#7 $\int x^7\,dx = \boxed{x^8/8 + C}$

#9 $\int 8x^{3/2}\,dx = 8\left(\frac{x^{5/2}}{5/2}\right) + C$
$= \boxed{16/5\, x^{5/2} + C}$

#11 $\int 9R^{-4}\,dR = \frac{9\,(R^{-3})}{-3} + C$
$= \boxed{-3R^{-3} + C}$

#13 $\int (x^2 - x^5)\,dx = \boxed{x^3/3 - x^6/6 + C}$

#15 $\int 9x^2 + x + 3\,dx = \frac{9x^3}{3} + \frac{x^2}{2} + 3x + C$
$= \boxed{3x^3 + \frac{1}{2}x^2 + 3x + C}$

#17 $\int \frac{t^2}{2} - \frac{2}{t^2}\,dt$
$= \int \frac{1}{2}t^2 - 2t^{-2}\,dt = \frac{1}{2}\frac{t^3}{3} - \frac{2t^{-1}}{-1} + C$
$\boxed{= \frac{1}{6}t^3 + 2t^{-1} + C}$

#19 $\int \sqrt{x}\,(x^2 - x)\,dx$
$= \int x^{5/2} - x^{3/2}\,dx$
$= \frac{x^{7/2}}{7/2} + \frac{x^{5/2}}{5/2} + C$
$= \boxed{\frac{2}{7}x^{7/2} + \frac{2}{5}x^{5/2} + C}$

#21 $\int 2x^{-2/3} + 3^{-2}\,dx$
$= 2\frac{x^{1/3}}{1/3} + 3^{-2}x + C$
$= \boxed{6x^{1/3} + \frac{1}{9}x + C}$

#23 $\int (1+12x^2)^2\,dx$
$= \int (1+12x^2)(1+12x^2)\,dx$
$= \int 1 + 24x^2 + 144x^4\,dx$
$= \boxed{x + \frac{24}{3}x^3 + \frac{144}{5}x^5 + C}$

#59
$f''(x) = 6$
$f'(1) = 8$
$f(1) = 2$

$f'(x) = \int 6\,dx$
$f'(x) = 6x + C$
$8 = 6(1) + C$
$C = 2$

$f'(x) = 6x + 2$
$f(x) = \int 6x + 2\,dx$
$f(x) = 3x^2 + 2x + C$
$2 = 3 + 2 + C$
$C = -3$
$\boxed{f(x) = 3x^2 + 2x - 3}$

NYA ELECTRO – ASSIGNMENT 9 B SOLUTIONS

9th Edition
P. 742 # 26, 28, 30, 32, 34, 36, 40
P. 835 # 4, 6, 8, 12, 14, 16, 24

P. 742 # 26 $\int (x^3-2)^6(3x^2)\,dx$

$u = x^3-2$
$du = 3x^2\,dx$

$= \int u^6\,du = \frac{u^7}{7}+C$

$= \boxed{\frac{(x^3-2)^7}{7}+C}$

 # 28 $\int -2(1-2x)^{1/3}\,dx$

$u = 1-2x$
$du = -2\,dx$

$= \int u^{1/3}\,du = \frac{u^{4/3}}{4/3}+C$

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

 # 30 $\int 6x^2(1-x^3)^{4/3}\,dx$

$u = 1-x^3$
$du = -3x^2\,dx$ so $-2du = 6x^2dx$

$= \int -2u^{4/3}\,du$

$= \frac{-2u^{7/3}}{7/3}+C$

$= \boxed{-\frac{6}{7}(1-x^3)^{4/3}+C}$

 # 32 $\int (0.3+2v)^{-3}\,dv$

$u = 0.3+2v$
$du = 2dv$
$\frac{1}{2}du = dv$

$= \int \frac{1}{2}(u)^{-3}\,du$

$= \frac{1}{2}\frac{u^{-2}}{-2}+C$

$= -\frac{1}{4}u^{-2}+C = \boxed{\frac{-1}{4}(0.3+2v)^{-2}+C}$

 # 34 $\int 2x^2(2x^3+1)^{-1/2}\,dx$

$u = 2x^3+1$
$du = 6x^2\,dx$
$\frac{1}{3}du = 2x^2\,dx$

$= \int \frac{1}{3}u^{-1/2}\,du$

$= \frac{1}{3}\frac{u^{1/2}}{1/2}+C$

$= \boxed{\frac{2}{3}(2x^3+1)^{1/2}+C}$

 # 36 $\int (x^2-x)(x^3-\frac{3}{2}x^2)^8\,dx$

$u = x^3-\frac{3}{2}x^2$
$du = 3x^2-3x\,dx$
$du = 3(x^2-x)dx$
$\frac{1}{3}du = (x^2-x)dx$

$= \int \frac{1}{3}u^8\,du = \frac{1}{3}\frac{u^9}{9}+C$

$= \boxed{\frac{1}{27}(x^3-\frac{3}{2}x^2)+C}$

#40 $\frac{dy}{dx} = 2x^3(x^4-6)^4$ CURVE PASSES THROUGH (2,10)

$$Y = \int \frac{dy}{dx}\, dx$$

$$= \int 2x^3(x^4-6)^4\, dx \qquad \begin{aligned} u &= x^4-6 \\ du &= 4x^3\, dx \\ \tfrac{1}{2}du &= 2x^3 dx \end{aligned}$$

$$= \int \tfrac{1}{2} u^4\, du$$

$$= \frac{1}{2}\frac{u^5}{5} + C$$

$$Y = \frac{1}{10}(x^4-6)^5 + C$$ PASSES THROUGH (2,10)

$$10 = \frac{1}{10}(2^4-6)^5 + C$$

$$10 = \frac{1}{10}(10)^5 + C$$

$$10 = 10^4 + C \implies C = 9990 \qquad Y = \frac{1}{10}(x^4-6)^5 - 9990$$

P. 835

#4 $\int \cos^5 x(-\sin x)\,dx$

$u = \cos x$

$du = -\sin x\, dy$

$$= \int u^5\, du = \frac{u^6}{6} + C$$

$$= \boxed{\frac{1}{6}\cos^6 x + C}$$

#6 $\int 8\sin^{1/2} x \cos x\, dx$

$u = \sin x$

$du = \cos x\, dx$

$$= \int 8u^{1/2}\, du = \frac{8u^{3/2}}{3/2} + C$$

$$\boxed{= \frac{16}{3}(\sin^{3/2} x) + C}$$

#8 $\int \sec^3 x(\sec x \tan x)\,dx$

$u = \sec x$

$du = \sec x \tan x\, dx$

$$= \int u^3\, du = \frac{u^4}{4} + C$$

$$= \boxed{\frac{1}{4}\sec^4 x + C}$$

#12 $\int \frac{20(\arccos 2t)^4}{\sqrt{1-4t^2}}\, dt$

$u = \arccos 2t$

$du = \frac{1}{\sqrt{1-(2t)^2}}(2)dt \implies du = \frac{-2}{\sqrt{1-4t^2}}\, dt$

$-10du = \frac{20}{\sqrt{1-4t^2}}\, dt$

$$= -\int 10u^4\, du = -2u^5 + C$$

$$\boxed{= -2\arccos 2t + C}$$

#14 $\displaystyle\int \frac{\text{ARCSIN}\,4x}{\sqrt{1-16x^2}}\,dx$

$U = \text{Arcsin}\,4x$

$du = \dfrac{1}{\sqrt{1-(4x)^2}} \cdot 4\,dx$

$\frac{1}{4}\,du = \dfrac{1}{\sqrt{1-16x^2}}\,dx$

$= \displaystyle\int \frac{1}{4} U\,du = \frac{1}{4}\frac{U^2}{2} + C$

$= \boxed{\frac{1}{8}(\text{ARCSIN}\,4x)^2 + C}$

#16 $\displaystyle\int \frac{0.8}{v}(3+2\ln v)\,dv$

$U = 3+2\ln v$

$du = \dfrac{2}{v}\,dv$

$\frac{1}{2}\,du = \frac{1}{v}\,dv$

$= \displaystyle\int 0.8\left(\frac{1}{2}\right) U\,du$

$= 0.4\,\dfrac{U^2}{2} + C = \boxed{0.2(3+2\ln v)^2 + C}$

#24 $\displaystyle\int (e^x+e^{-x})^{1/4}(e^x-e^{-x})\,dx$

$u = e^x + e^{-x}$

$du = (e^x - e^{-x})\,dx$

$= \displaystyle\int U^{1/4}\,du$

$= \dfrac{U^{5/4}}{5/4} + C$

$= \boxed{4/5\,(e^x+e^{-x}) + C}$