

6.3
 (17) $\int e^x \sin x \, dx$

$u = \sin x \quad v = e^x$
 $du = \cos x \, dx \quad dv = e^x \, dx$

$\int e^x \sin x \, dx = e^x \sin x - \int e^x \cos x \, dx$
 $u = \cos x \quad v = e^x$
 $du = -\sin x \, dx \quad dv = e^x \, dx$

$\int e^x \sin x \, dx = e^x \sin x - (e^x \cos x - \int -e^x \sin x \, dx)$

$\int e^x \sin x \, dx = e^x \sin x - e^x \cos x - \int e^x \sin x \, dx$
 $+ \int e^x \sin x \, dx \qquad + \int e^x \sin x \, dx$

$\frac{2 \int e^x \sin x \, dx}{2} = \boxed{\frac{e^x \sin x - e^x \cos x}{2} + C}$

(23) $\int_0^\pi x \sin x \, dx$
 $u = x \quad v = -\cos x$
 $du = dx \quad dv = \sin x \, dx$

$\int_0^\pi -x \cos x + \int_0^\pi \cos x \, dx$

$\int_0^\pi -x \cos x + \sin x$

$[-\pi \cos \pi + \sin \pi] - [-0 \cdot \cos 0 + \sin 0]$

π

$\int_0^{2\pi} + \int_0^\pi + \int_\pi^{2\pi}$

$\pi + 3\pi = 4\pi$

$\int_\pi^{2\pi} x \sin x \, dx$

$\int_\pi^{2\pi} -x \cos x + \sin x$

$[-2\pi \cos 2\pi + \sin 2\pi] - [-\pi \cos \pi + \sin \pi]$

$-2\pi - \pi = -3\pi$

3π

6.3
 23) $\int x^3 e^{-2x} dx$

SIGN	u	dv
+	x^3	e^{-2x}
-	$3x^2$	$-\frac{1}{2}e^{-2x}$
+	$6x$	$\frac{1}{4}e^{-2x}$
-	6	$-\frac{1}{8}e^{-2x}$
+	0	$\frac{1}{16}e^{-2x}$

$$-\frac{1}{2}x^3 e^{-2x} - \frac{3}{4}x^2 e^{-2x} - \frac{3}{4}x e^{-2x} - \frac{3}{8}e^{-2x} + C$$

11) $\frac{dy}{dx} = (x+2) \sin x$ $u = x+2$ $v = -\cos x$

$\int dy = \int (x+2) \sin x dx$ $du = dx$ $dv = \sin x dx$

$y = (x+2)(-\cos x) + \sin x + C$
 $(x+2)(-\cos x) + \int +\cos x dx$

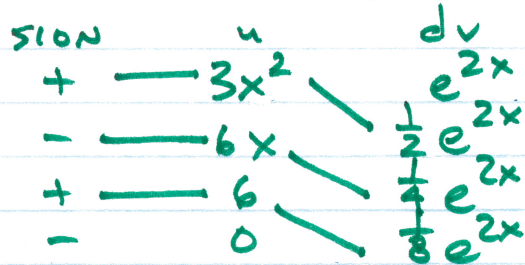
$2 = (0+2)(-\cos 0) + \sin 0 + C$

$2 = -2 + C$

$4 = C$

$$y = (x+2)(-\cos x) + \sin x + 4$$

6.3
 ⑦ $\int 3x^2 e^{2x} dx$



~~DA~~

$$\frac{3}{2} x^2 e^{2x} + -\frac{3}{2} x e^{2x} + \frac{3}{4} e^{2x} + C$$