1. **(1)** $\displaystyle\int (18x^4 - 4x - 6)\,dx = \frac{18}{5}x^5 - 2x^2 - 6x + C.$

(2)

$$
\begin{aligned}
\int_{-2}^{1} \left(-9x^2 - 1\right) dx &= \left[-3x^3 - x\right]_{-2}^{1} \\
&= \left(-3 \times 1^3 - 1\right) - \left(-3 \times (-2)^3 - (-2)\right) \\
&= -3 - 1 - (24 + 2) \\
&= -4 - 26 \\
&= -30
\end{aligned}
$$

(3)

$$
\begin{aligned}
&\int_{-2\pi}^{-\pi} \left(-15\sin(-x) - 10\cos(-x)\right) dx \\
={}& \left[-15\cos(-x) + 10\sin(-x)\right]_{-2\pi}^{-\pi} \\
={}& \left(-15\cos(-(-\pi)) + 10\sin(-(-\pi))\right) - \left(-15\cos(-(-2\pi)) + 10\sin(-(-2\pi))\right) \\
={}& \left(-15(-1) + 10(0)\right) - \left(-15(1) + 10(0)\right) \\
={}& (15) - (-15) \\
={}& 30
\end{aligned}
$$

2. **(1)** $\displaystyle\int (-8x^2 + 5x + 9e^x)\,dx = -\frac{8}{3}x^3 + \frac{5}{2}x^2 + 9e^x + C.$

(2)

$$
\begin{aligned}
\int_{1}^{3} \left(15x^2 - 10x + 9\right) dx &= \left[5x^3 - 5x^2 + 9x\right]_{1}^{3} \\
&= \left(5 \times 3^3 - 5 \times 3^2 + 9 \times 3\right) - \left(5 \times 1^3 - 5 \times 1^2 + 9 \times 1\right) \\
&= 135 - 45 + 27 - (5 - 5 + 9) \\
&= 117 - 9 \\
&= 108
\end{aligned}
$$

(**3**)

$$\int_{-2\pi}^{\pi/2} \left(-12\sin\left(-3x\right) - 8\cos\left(-4x\right)\right) dx$$

$$= \left[-4\cos\left(-3x\right) + 2\sin\left(-4x\right)\right]_{-2\pi}^{\pi/2}$$

$$= \left(-4\cos\left(-3\left(\pi/2\right)\right) + 2\sin\left(-4\left(\pi/2\right)\right)\right) - \left(-4\cos\left(-3\left(-2\pi\right)\right) + 2\sin\left(-4\left(-2\pi\right)\right)\right)$$

$$= \left(-4\cos\left(-3\pi/2\right) + 2\sin\left(-2\pi\right)\right) - \left(-4\cos\left(6\pi\right) + 2\sin\left(8\pi\right)\right)$$

$$= \left(-4\left(0\right) + 2\left(0\right)\right) - \left(-4\left(1\right) + 2\left(0\right)\right)$$

$$= \left(0\right) - \left(-4\right)$$

$$= 4$$

3. (**1**) $\int \left(12x^5 + x - 3\right) dx = 2x^6 + \dfrac{1}{2}x^2 - 3x + C.$

(**2**)

$$\int_{-1}^{1} \left(-9x^2 - 2x - 10\right) dx = \left[-3x^3 - x^2 - 10x\right]_{-1}^{1}$$

$$= \left(-3 \times 1^3 - 1^2 - 10 \times 1\right) - \left(-3 \times \left(-1\right)^3 - \left(-1\right)^2 - 10 \times \left(-1\right)\right)$$

$$= -3 - 1 - 10 - \left(3 - 1 + 10\right)$$

$$= -14 - 12$$

$$= -26$$

(**3**)

$$\int_{-3\pi}^{-2\pi} \left(20\sin\left(2x\right)\right) dx$$

$$= \left[-10\cos\left(2x\right)\right]_{-3\pi}^{-2\pi}$$

$$= \left(-10\cos\left(2\left(-2\pi\right)\right)\right) - \left(-10\cos\left(2\left(-3\pi\right)\right)\right)$$

$$= \left(-10\cos\left(-4\pi\right)\right) - \left(-10\cos\left(-6\pi\right)\right)$$

$$= \left(-10\left(1\right)\right) - \left(-10\left(1\right)\right)$$

$$= \left(-10\right) - \left(-10\right)$$

$$= 0$$

4. (**1**) $\int \left(7x^6 + 3\cos x - 9\right) dx = x^7 + 3\sin x - 9x + C.$

(2)

$$\int_0^2 \left(3x^2 + 10x - 6\right) dx = \left[x^3 + 5x^2 - 6x\right]_0^2$$
$$= \left(2^3 + 5 \times 2^2 - 6 \times 2\right) - \left(0^3 + 5 \times 0^2 - 6 \times 0\right)$$
$$= 8 + 20 - 12 - 0$$
$$= 16 - 0$$
$$= 16$$

(3)

$$\int_{3\pi}^{4\pi} \left(-20\sin\left(-4x\right) + 3\cos\left(3x\right)\right) dx$$

$$= \left[-5\cos\left(-4x\right) + \sin\left(3x\right)\right]_{3\pi}^{4\pi}$$

$$= \left(-5\cos\left(-4\left(4\pi\right)\right) + \sin\left(3\left(4\pi\right)\right)\right) - \left(-5\cos\left(-4\left(3\pi\right)\right) + \sin\left(3\left(3\pi\right)\right)\right)$$

$$= \left(-5\cos\left(-16\pi\right) + \sin\left(12\pi\right)\right) - \left(-5\cos\left(-12\pi\right) + \sin\left(9\pi\right)\right)$$

$$= \left(-5\left(1\right) + \left(0\right)\right) - \left(-5\left(1\right) + \left(0\right)\right)$$

$$= \left(-5\right) - \left(-5\right)$$

$$= 0$$

5. **(1)** $\int \left(-3x^2 - 5e^x - 8\sin x\right) dx = -x^3 - 5e^x + 8\cos x + C.$

(2)

$$\int_{-2}^0 \left(9x^2 - 4x + 6\right) dx = \left[3x^3 - 2x^2 + 6x\right]_{-2}^0$$
$$= \left(3 \times 0^3 - 2 \times 0^2 + 6 \times 0\right) - \left(3 \times \left(-2\right)^3 - 2 \times \left(-2\right)^2 + 6 \times \left(-2\right)\right)$$
$$= 0 - \left(-24 - 8 - 12\right)$$
$$= 0 - \left(-44\right)$$
$$= 44$$

(3)

$$\int_{2\pi}^{3\pi} \left(20\cos\left(4x\right)\right) dx$$

$$= \left[5\sin\left(4x\right)\right]_{2\pi}^{3\pi}$$

$$= \left(5\sin\left(4\left(3\pi\right)\right)\right) - \left(5\sin\left(4\left(2\pi\right)\right)\right)$$

$$= \left(5\sin\left(12\pi\right)\right) - \left(5\sin\left(8\pi\right)\right)$$

$$= \left(5\left(0\right)\right) - \left(5\left(0\right)\right)$$

$$= \left(0\right) - \left(0\right)$$

$$= 0$$