S 154 Nr 9

a) $\displaystyle\int_0^{\pi} (2\sin(x) + 1)\,dx = \Big[2\cdot(-\cos(x) + x\Big]_0^{\pi} = \Big[-2\cos x + x\Big]_0^{\pi}$

$= -2\cdot\cos(\pi) + \pi - [-2\cos(0) + 0] = -2\cdot(-1) + \pi - [-2\cdot(1) + 0]$

$= 2 + \pi + 2 = \underline{\underline{4 + \pi}}$

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b) $\displaystyle\int_0^{4\pi} (-\sin(x) - 2)\,dx = \Big[+\cos(x) - 2x\Big]_0^{4\pi} = \cos(4\pi) - 2\cdot 4\pi - \cos(0)$

$= 1 - 8\pi - 1 = \underline{\underline{-8\pi}}$

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c) $\displaystyle\int_0^{\frac{\pi}{2}} 3\cdot\sin(2x)\,dx = \Big[3\cdot(-\cos(2x)\cdot\frac{1}{2}\Big]_0^{\frac{\pi}{2}} = \Big[-\frac{3}{2}\cos(2x)\Big]_0^{\frac{\pi}{2}}$

$= -\frac{3}{2}\cos(2\cdot\frac{\pi}{2}) - [-\frac{3}{2}\cos(2\cdot 0)] = -\frac{3}{2}\cdot(-1) + \frac{3}{2}\cdot 1 = \frac{6}{2} = \underline{\underline{3}}$

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d) $\displaystyle\int_0^{\pi} 3\cos(x)\,dx = \Big[3\cdot\sin(x)\Big]_0^{\pi} = 3\cdot\sin(\pi) - 3\sin(0) = 0 - 0 = \underline{\underline{0}}$

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e) $\displaystyle\int_{-\pi}^{0} 3\sin(0{,}5(x-\pi)\,dx = \Big[-3\cdot\cos(0{,}5(x-\pi))\cdot\frac{1}{0{,}5}\Big]_{-\pi}^{0}$

$= \Big[-6\cdot\cos(0{,}5(x-\pi))\Big]_{-\pi}^{0} = -6\cdot\underbrace{\cos(0{,}5(0-\pi)}_{=0} - [-6\cdot\underbrace{\cos(0{,}5(-\pi-\pi))}_{=-1}]$

$\underline{\underline{= -6}}$

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f.) $\displaystyle\int_{-\pi}^{\pi} (-5\cos(3x) + x)\,dx = \Big[-5\cdot\sin(3x)\cdot\frac{1}{3} + \frac{x^2}{2}\Big]_{-\pi}^{\pi} =$

$= -\frac{5}{3}\cdot\underbrace{\sin(3\pi)}_{=0} + \frac{\pi^2}{2} - [-\frac{5}{3}\cdot\underbrace{\sin(3\cdot(-\pi))}_{=0} + \frac{(-\pi)^2}{2}] = +\frac{\pi^2}{2} - \frac{\pi^2}{2} = \underline{\underline{0}}$