HW 6.4 p. 310 2, 6, 12, 14, 18, 46, 48

Monday, February 2, 2015 12:05 AM

(2) $y = \int_2^x (3t + \cos t^2)\,dt$

$\frac{dy}{dx} = \boxed{3x + \cos x^2}$

(6) $y = \int_4^x e^u \sec u\,du$

$\frac{dy}{dx} = \boxed{e^x \sec x\,dx}$

(12) $y = \int_\pi^{\pi - x} \frac{1+\sin^2 u}{1+\cos^2 u}\,du$

$\frac{dy}{dx} = \frac{1+\sin^2(\pi - x)}{1+\cos^2(\pi - x)} \cdot \frac{d}{dx}(\pi - x)$

$= \boxed{-\frac{1+\sin^2(\pi - x)}{1+\cos^2(\pi - x)}}$

(14) $y = \int_x^7 \sqrt{2t^4 + t + 1}\,dt = -\int_7^x \sqrt{2t^4 + t + 1}\,dt$

$\frac{dy}{dx} = \boxed{-\sqrt{2x^4 + x + 1}}$

(18) $\int_{3x^2}^{10} \ln(2+p^2)\,dp = -\int_{10}^{3x^2} \ln(2+p^2)\,dp$

$\frac{dy}{dx} = -\ln(2+(3x^2)^2) \cdot [6x]$

$= \boxed{-6x\ln(2+9x^4)}$

(46) $A = \int_0^1 \sqrt{x}\,dx + \int_1^2 x^2\,dx$

$= \frac{2}{3}x^{\frac{3}{2}}\Big|_0^1 + \frac{1}{3}x^3\Big|_1^2$

$= \left[\frac{2}{3}(1)^{\frac{3}{2}} - \frac{2}{3}(0)^{\frac{3}{2}}\right] + \left[\frac{1}{3}(2)^3 - \frac{1}{3}(1)^3\right]$

$= \frac{2}{3} + \frac{8}{3} - \frac{1}{3}$

$= \boxed{3}$

(48) $A = \int_{\frac{\pi}{6}}^{\frac{5\pi}{6}} \sin x\,dx - \left[\frac{4\pi}{6} \cdot \frac{1}{2}\right]$ (Arect)

$= -\cos x\Big|_{\frac{\pi}{6}}^{\frac{5\pi}{6}} - \frac{\pi}{3}$

$= \left[\cos\frac{5\pi}{6} - -\cos\frac{\pi}{6}\right] - \frac{\pi}{3}$

$= -\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} - \frac{\pi}{3}$

$= \boxed{\sqrt{3} - \frac{\pi}{3}}$