Sec 3.7

#25. (a) $h'(3) = f'(g(3))\,g'(3) = f'(1)\cdot 20 = 5\cdot 20 = 100$

(b) $h'(2) = f'(g(2))\,g'(2) = f'(5)\cdot 10 = -10\cdot 10 = -100$

(c) $p'(4) = g'(f(4))\,f'(4) = g'(1)\cdot(-8) = 2\cdot(-8) = -16$

(d) $p'(2) = g'(f(2))\,f'(2) = g'(3)\cdot 2 = 20\cdot 2 = 40$

(e) $h'(5) = f'(g(5))\,g'(5) = f'(2)\cdot 20 = 2\cdot 20 = 40$

#28. $\frac{dy}{dx} = 8(x^2+2x+7)^7(2x+2) = 16(x^2+2x+7)^7(x+1)$

#36. $\frac{d}{dt} e^{\tan t} = e^{\tan t}\sec^2 t$

#40. $\frac{d}{dx}\, x(x+1)^{1/3} = (x+1)^{\frac{1}{3}} + x\cdot\frac{1}{3}(x+1)^{-\frac{2}{3}} = \frac{1}{3}(x+1)^{-\frac{2}{3}}(3x+3+x)$

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

#42. $\frac{d}{d\theta}(\cos^4\theta + \sin^4\theta) = 4\cos^3\theta(-\sin\theta) + 4\sin^3\theta\cos\theta$

$= 4\sin\theta\cos\theta(\sin^2\theta - \cos^2\theta)$

#44. $\frac{d}{dz}\sin(4\cos z) = \cos(4\cos z)(-4\sin z) = -4\cos(4\cos z)\sin z$

#52. $f'(x) = e^{7x} + x\cdot 7e^{7x} = (7x+1)e^{7x}$

#58. $\frac{d}{dx}(1-e^{-0.05x})^{-1} = -(1-e^{-0.05x})^{-2}(-e^{-0.05x})(-0.05)$

$= -0.05\,e^{-0.05x}(1-e^{-0.05x})^{-2}$

#60. $\frac{d}{dx}\sqrt{x+\sqrt{x+\sqrt{x}}} = \frac{1}{2\sqrt{x+\sqrt{x+\sqrt{x}}}}\cdot\left(1+\frac{1}{2\sqrt{x+\sqrt{x}}}\right)\cdot\left(1+\frac{1}{2\sqrt{x}}\right)$

#68. $\frac{d}{dx}\left(\frac{3x}{4x+2}\right)^5 = 5\left(\frac{3x}{4x+2}\right)^4 \frac{(4x+2)\cdot 3 - 3x\cdot 4}{(4x+2)^2} = 5\left(\frac{3x}{4x+2}\right)^4\cdot\frac{6}{(4x+2)^2}$

$= \frac{1215\,x^4}{32\,(2x+1)^6}$

#72. $\frac{d}{dt}\frac{te^t}{t+1} = \frac{(t+1)(e^t+te^t)-te^t}{(t+1)^2} = \frac{(t^2+t+1)e^t}{(t+1)^2}$

#74. $\frac{d}{dz}(2z+5)^{1.75}\tan z = 1.75(2z+5)^{0.75}\cdot 2\tan z + (2z+5)^{1.75}\sec^2 z$

$= (2z+5)^{0.75}\left[3.5\tan z + (2z+5)\sec^2 z\right]$