Practice
Page 103: start with 6bfj ... m, n
... and more if you have time.

6f) $f(t) = \dfrac{(1+2t)^5}{(3t^2-5)^2}$

$\dfrac{dy}{dx} = \dfrac{f'g - fg'}{g^2}$

$f = (1+2t)^5$

$f' = 5(1+2t)^4 \cdot \frac{d}{dt}(1+2t)$

$f' = 5(1+2t)^4(2)$

$f' = 10(1+2t)^4$

$g = (3t^2-5)^2$

$g' = 2(3t^2-5)^1 \cdot \frac{d}{dt}(3t^2-5)$

$g' = 2(3t^2-5)(6t)$

$g' = 12t(3t^2-5)$

$$f'(t) = \frac{10(1+2t)^4(3t^2-5)^2 - (1+2t)^5(12t)(3t^2-5)}{[(3t^2-5)^2]^2}$$

$$= \frac{2(1+2t)^4(3t^2-5)\left[5(1)(3t^2-5) - (1+2t)(6t)(1)\right]}{[3t^2-5]^4}$$

$$\frac{2(1+2t)^4(3t^2-5)\left[15t^2-25-6t-12t^2\right]}{(3t^2-5)^4}$$

$$\frac{2(1+2t)^4(3t^2-6t-25)}{(3t^2-5)^3}$$

n)

$$y = \left(x + \left(x + x^{1/2}\right)^{1/2}\right)^{1/2}$$

$$y = \left[x + \left(x + x^{1/2}\right)^{1/2}\right]^{1/2}$$

$$\frac{dy}{dx} = \frac{1}{2}\left[\quad\right]^{-1/2} \frac{d}{dx}\left[x + \left(x + x^{1/2}\right)^{1/2}\right]$$

$$\frac{dy}{dx} = \frac{1}{2}\left[\quad\right]^{-1/2}\left[1 + \frac{d}{dx}\left(x + x^{1/2}\right)^{1/2}\right]$$

$$\frac{dy}{dx} = \frac{1}{2}\left[\quad\right]^{-1/2}\left[1 + \frac{1}{2}\left(x + x^{1/2}\right)^{-1/2} \cdot \frac{d}{dx}\left(x + x^{1/2}\right)\right]$$

$$\frac{dy}{dx} = \frac{1}{2}\left[\quad\right]^{-1/2}\left[1 + \frac{1}{2}\left(x + x^{1/2}\right)^{-1/2} \cdot \left(1 + \frac{d}{dx}x^{1/2}\right)\right]$$

$$\frac{dy}{dx} = \frac{1}{2}\left[\quad\right]^{-1/2}\left[1 + \frac{1}{2}\left(x + x^{1/2}\right)^{-1/2}\left(1 + \frac{1}{2}x^{-1/2}\right)\right]$$

$$\frac{dy}{dx} = \frac{1}{2\sqrt{x + \sqrt{x + \sqrt{x}}}}\left[1 + \frac{1}{2\sqrt{x + \sqrt{x}}}\underbrace{\left(1 + \frac{1}{2\sqrt{x}}\right)}_{\text{add}}\right]$$

$$\underbrace{\frac{1}{2\sqrt{x + \sqrt{x}}}\left(\frac{2\sqrt{x} + 1}{2\sqrt{x}}\right)}_{\text{multiply}}$$

$$\left[1 + \frac{2\sqrt{x} + 1}{4\sqrt{x}\sqrt{x + \sqrt{x}}}\right]$$

add fractions??