Taylor Storrs

2.4+ Homework Board Problems

5. $y = \sec\theta\tan\theta$ — Jared G

$(\sec\theta)(\sec^2\theta) + (\tan\theta)(\sec\theta)(\tan\theta)$

$\sec^3\theta + (\tan^2\theta)(\sec\theta)$

or $\sec$ → $\boxed{\sec\theta(\sec^2 + \tan^2)}$

7. $y = c\cos t + t^2\sin t$ — Ray White

$[c(-\sin t) + 0(\cos t)] + [t^2(\cos t) + 2t(\sin t)]$

$[-c\sin t + 0] + [t^2(\cos t) + 2t(\sin t)]$

$\boxed{-c\sin t + t(\cos t + 2\sin t)}$

9. $y = \frac{x}{2-\tan x}$ $\quad f' = 1$ $\quad g' = -\sec^2 x$ — Hunter Henzler

$\frac{(2-\tan x)(1) - (x)(-\sec^2 x)}{(2-\tan x)^2}$

$\boxed{\frac{2 - \tan x + x\sec^2 x}{(2-\tan x)^2}}$

11. $y = \frac{\sec\theta}{1+\sec\theta}$ $\quad f' = (\sec\theta)(\tan\theta)$ $\quad g' = 0 + (\sec\theta)(\tan\theta)$ — Marlysta Boucher

$\frac{(1+\sec\theta)(\sec\theta)(\tan\theta) - (\sec\theta)(\sec\theta)(\tan\theta)}{(1+\sec\theta)^2}$

$\sec\theta\tan\theta + \cancel{\sec^2\theta\tan\theta} - \cancel{\sec^2\theta\tan\theta}$

$\boxed{\frac{\sec\theta\tan\theta}{(1+\sec\theta)^2}}$

Ian & Caleb

? 15. $y = \theta \csc\theta - \cot\theta$ $\quad f' = 1$ $\quad g' = (\theta)(-\csc\theta)(\cot\theta)$

$(1)(\csc\theta) + \theta(-\csc\theta)(\cot\theta)$ $\quad g' = (-\csc^2\theta)$

$\csc\theta - \theta\csc\theta\cot\theta - \cot\theta$

f $\quad g$

? $\csc\theta - \theta\csc\theta\cot\theta - (-\csc^2\theta)$

$\boxed{\csc\theta - \theta\csc\theta\cot\theta + \csc^2\theta}$

23. $y = \cos x - \sin x, \ (\pi, -1)$ Whitney Jordand

$y' = -\sin x - \cos x$

$= -\sin\pi - \cos\pi$

$= -(0) - (-1)$

$m = 1$

$y + 1 = 1(x - \pi)$

$\boxed{y = x - \pi - 1}$

25. a) $y = 2x \sin x, \ (\frac{\pi}{2}, \pi)$ Jonathan Dansby

$f' = 2 \quad g' = \cos x$

$y' = 2(\sin x) + 2x(\cos x)$

$= 2\sin x + 2x\cos x$

$= 2\sin(\frac{\pi}{2}) + 2(\frac{\pi}{2})\cos(\frac{\pi}{2})$

$= 2(1) + \frac{2\pi}{2}(0)$?

$= 2 + 0 = 2 = m$

$y - \pi = 2(x - \frac{\pi}{2})$

$y - \pi = 2x - \pi$

$+\pi \qquad +\pi$

$\boxed{y = 2x}$

21. $y = \sec x, \left(\frac{\pi}{3}, 2\right)$ — Andrew Hettick

$y' = \sec x \tan x$

$= \sec\left(\frac{\pi}{3}\right)\tan\left(\frac{\pi}{3}\right)$

$m = 2\sqrt{3}$?

$y - 2 = 2\sqrt{3}\left(x - \frac{\pi}{3}\right)$

$y - 2 = 2\sqrt{3}x - \frac{2\sqrt{3}x}{3}$

$+2 \qquad\qquad +2$

$$\boxed{y = 2\sqrt{3}x - \frac{2\sqrt{3}x}{3} + 2}$$

13. $y = \underbrace{\frac{t}{1+t}}_{f}\underbrace{\sin t}_{g}$ ← product rule →

$f' = 1(\sin t) + (t)(\cos t)$ $\qquad g' = 1$

$y' = \dfrac{(\sin t + t\cos t)(1+t) - 1(t\sin t)}{(1+t)^2}$

Jonathan Dansby

$\sin t + t\cos t + t\sin t + t^2\cos t - t\sin t$

$$y' = \frac{\sin t + t\cos t + t^2\cos t}{(1+t)^2}$$

factor out cost

$$\boxed{y' = \frac{\sin t + \cos t(t + t^2)}{(1+t)^2}}$$