HW 6 Solution

Section 3.5 #8

$$\frac{dy}{dx} = y'(u(x)) \cdot u'(x)$$

Since $y'(u(x)) = 2u = 2(\ln x)$

and $u'(x) = \frac{1}{x}$

then $\frac{dy}{dx} = y'(u(x)) \cdot u'(x)$

$$= 2(\ln x)\frac{1}{x}$$

Section 3.5 #40

$T(x) = \ln(\sec x + \tan x)$

$T(x) = g(h(x))$

where $g(u) = \ln u$

and $h(x) = \sec x + \tan x$

So $g'(u) = \frac{1}{u}$

So $g'(h(x)) = \frac{1}{\sec x + \tan x}$

and $h'(x) = \sec x \tan x + \sec^2 x$

So $T'(x) = \left(\frac{1}{\sec x + \tan x}\right) \cdot (\sec x \tan x + \sec^2 x)$

Section 3.6 #8

$$(2x+3y)^2 = 10$$

$$2(2x+3y)(2x+3y)' = 0$$

$$2(2x+3y)\left(2+3\frac{dy}{dx}\right) = 0$$

$$4(2x+3y) + 6\frac{dy}{dx}(2x+3y) = 0$$

$$6\frac{dy}{dx}(2x+3y) = -4(2x+3y)$$

$$\frac{dy}{dx} = \frac{-4(2x+3y)}{6(2x+3y)} = -\frac{2}{3}$$