

Math 126 HW #7

7.1 24, ~~30~~

7.2 38, 79

7.3 7, 31

7.1 #24

$$f(x) = \frac{4x-1}{2x+3} \quad \text{so find } f^{-1}$$

$$y = \frac{4x-1}{2x+3}$$

$$3y+1 = x(4-2y)$$

$$(2x+3)y = 4x-1$$

$$x = \frac{3y+1}{4-2y}$$

$$2xy + 3y = 4x - 1$$

$$\text{so } f^{-1}(y) = \frac{3y+1}{4-2y}$$

$$3y+1 = 4x - 2xy$$

7.2 #38

$$f(t) = \sin(e^t) + e^{\sin t}$$

$$f'(t) = \cos(e^t) \cdot \frac{d}{dt}(e^t) + e^{\sin t} \cdot \frac{d}{dt}(\sin t)$$

$$= e^t \cos e^t + \cos t e^{\sin t}$$

7.2 #79

$$\int \sin x e^{\cos x} dx$$

$$u = \cos x$$

$$du = -\sin x dx$$

$$= -\int e^u du = -e^u + C$$

$$= -e^{\cos x} + C$$

7.3 #7

$$\begin{aligned} \text{a) } \log_2 6 - \log_2 15 + \log_2 20 & \\ &= \log_2 \frac{6}{15} + \log_2 20 = \log_2 \frac{6 \cdot 20}{15} \\ &= \log_2 \frac{120}{15} = \log_2 8 = \log_2 2^3 = 3 \end{aligned}$$

$$\begin{aligned} \text{b) } \log_3 100 - \log_3 18 - \log_3 50 &= \log_3 \frac{100}{50} - \log_3 18 \\ &= \log_3 2 - \log_3 18 = \log_3 \frac{2}{18} \\ &= \log_3 \frac{1}{9} = \log_3 3^{-2} = -2 \end{aligned}$$

7.3 #31

$$\ln(\ln x) = 1$$

$$\ln x = e^1 = e$$

$$\underline{x = e^e}$$