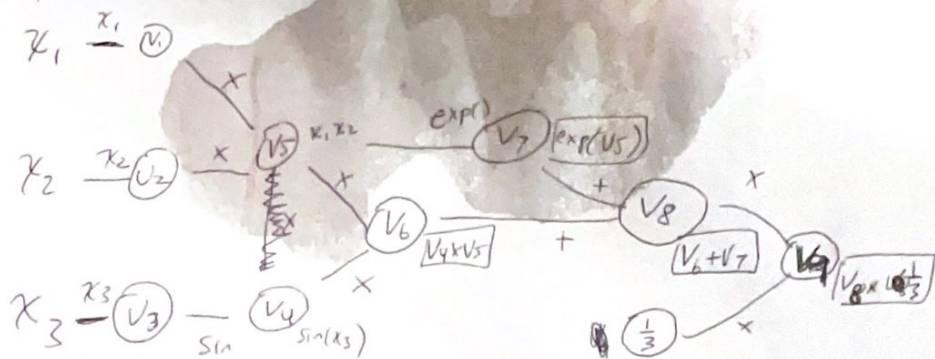a)

$$\frac{1}{3}\left(x_1 x_2 \sin(x_3) + e^{x_1 x_2}\right)$$

b)

$V_1 = x_1$

$V_2 = x_2$

$V_3 = x_3$

$V_4 = \sin(V_3)$

$V_5 = V_1 \times V_2$

$V_6 = V_4 \times V_5$

$V_7 = \exp(V_5)$

$V_8 = V_6 + V_7$

$y = V_9 = \frac{1}{3} \cdot V_8$

d)

$z_1 = \frac{dy}{dz_1} = \frac{dy}{dz_5} \cdot \frac{dz_5}{dz_1} = \frac{1}{3}(V_6+1)e^{V_5} \cdot V_2$

$z_2 = \frac{dy}{dz_2} = \frac{dy}{dz_5} \cdot \frac{dz_5}{dz_2} = \frac{1}{3}(V_6+1)e^{V_5} \cdot V_1$

$z_3 = \frac{dy}{dz_3} = \frac{dy}{dz_4} \cdot \frac{dz_4}{dz_3} = \frac{1}{3}(1+V_7) \cdot V_5 \cdot \cos(V_3)$

$z_4 = \frac{dy}{dz_4} = \frac{dy}{dz_6} \cdot \frac{dz_6}{dz_4} = \frac{1}{3}(1+V_7) \cdot V_5$

$z_5 = \frac{dy}{dz_5} = \frac{dy}{dz_7} \cdot \frac{dz_7}{dz_5} = \frac{1}{3}(V_6+1)e^{V_5}$

$z_6 = \frac{dy}{dz_6} = \frac{dy}{dz_8} \cdot \frac{dz_8}{dz_6} = \frac{1}{3}(1+V_7)$

$z_7 = \frac{dy}{dz_7} = \frac{dy}{dz_8} \cdot \frac{dz_8}{dz_7} = \frac{1}{3}(V_6+1)$

$z_8 = \frac{dy}{dz_8} = \frac{dy}{dz_9} \cdot \frac{dz_9}{dz_8} = \frac{1}{3}$

$z_9 = \frac{dy}{dz_9} = 1$

c) $V_1 = 1$

$V_2 = 0$

$V_3 = 0$

$V_4 = \sin(0)$

$V_5 = 1 \times 0 = 0$

$V_6 = \sin(0) \times 0 = 0$

$V_7 = \exp(0) = 1$

$V_8 = 0 + 1 = 1$

$y = V_9 = \frac{1}{3} \times 1 = 1$