1 Differenciation

Differenciate the following expressions:

$$\tan(x) \tag{1}$$

$$e^{e^{-6x}} \tag{2}$$

$$\csc^6(\cos(x)) \tag{3}$$

$$\ln(\sin(\cos(x))) \tag{4}$$

$$\frac{1}{\cos\left(\frac{1}{x}\right)} \tag{5}$$

$$e^{\cot(x)} \tag{6}$$

$$\ln(\cos(\tan(x))) \tag{7}$$

$$\sin(\tan(\tan(x))) \tag{8}$$

$$\ln\left(\frac{1}{x^{36}}\right) \tag{9}$$

$$\sin^4(\tan(x)) \tag{10}$$

$$-3\tan(\tan(x)) - 2 \tag{11}$$

$$\ln(\tan(x) + 7) \tag{12}$$

$$\cos(\tan(2x + 5)) \tag{13}$$

$$\cos\left(e^{-x}\right) \tag{14}$$

$$\tan^4(\cos(x)) \tag{15}$$

$$\frac{1}{\ln(e^x)^9} \tag{16}$$

$$\sec\left(\tan\left(\frac{1}{x}\right)\right) \tag{17}$$

$$e^{\cos(\cos(x))} \tag{18}$$

$$\ln\left(\cos\left(\frac{1}{x^8}\right)\right) \tag{19}$$

$$\tan\left(e^{\frac{1}{x^8}}\right) \tag{20}$$

2 Matrices

Calculate the inverse of the following:

$$\begin{bmatrix} 5 & -7 & 7 \\ 7 & 6 & 2 \\ 9 & -5 & 3 \end{bmatrix} \tag{21}$$

$$\begin{bmatrix} 3 & 7 & -9 \\ 8 & -4 & -7 \\ 9 & 3 & -6 \end{bmatrix} \tag{22}$$

$$\begin{bmatrix} 6 & 6 & 8 \\ -2 & -5 & -5 \\ 1 & -9 & -9 \end{bmatrix} \tag{23}$$

$$\begin{bmatrix} 0 & 1 & -2 \\ 2 & -1 & -2 \\ -3 & -4 & -4 \end{bmatrix} \tag{24}$$

$$\begin{bmatrix} -3 & -9 & -5 \\ -4 & -1 & -1 \\ -3 & 5 & 4 \end{bmatrix} \tag{25}$$

$$\begin{bmatrix} 3 & 8 & 1 \\ -4 & -5 & 6 \\ -1 & 8 & -4 \end{bmatrix} \tag{26}$$

$$\begin{bmatrix} 3 & -1 & 9 \\ 7 & 1 & -8 \\ 7 & -6 & -2 \end{bmatrix} \tag{27}$$

$$\begin{bmatrix} 9 & 2 & 8 \\ 7 & -7 & 5 \\ -6 & 8 & -6 \end{bmatrix} \tag{28}$$

$$\begin{bmatrix} 5 & -2 & 1 \\ -6 & -9 & 1 \\ -7 & 0 & -8 \end{bmatrix} \tag{29}$$

$$\begin{bmatrix} 5 & 0 & 4 \\ 2 & -9 & 5 \\ 5 & 9 & 4 \end{bmatrix} \tag{30}$$