1 Differenciation

Differenciate the following expressions:

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

$$e^{\cot\left(\ln\left(x\right)\right)} \tag{2}$$

$$\csc\left(\tan\left(x\right)\right)+3 \tag{3}$$

$$e^{\cos\left(9x+9\right)} \tag{4}$$

$$-\sin\left(5\tan\left(x\right)+9\right) \tag{5}$$

$$\tan^{4}\left(\csc\left(x\right)\right) \tag{6}$$

$$\sec\left(5+\frac{8}{x}\right) \tag{7}$$

$$\cos\left(x\right) \tag{8}$$

$$\ln\left(\tan\left(\ln\left(x\right)\right)\right) \tag{9}$$

$$\sin^{6}\left(\frac{1}{x}\right) \tag{10}$$

$$\frac{1}{\ln\left(x\right)^{12}} \tag{11}$$

$$\cos\left(6\sin\left(x\right)-2\right) \tag{12}$$

$$\ln\left(\ln\left(\cos\left(x\right)\right)\right) \tag{13}$$

$$\tan\left(\frac{1}{x^{2}}\right) \tag{14}$$

$$\ln\left(\frac{1}{\cos\left(x\right)}\right) \tag{15}$$

$$e^{\cot^{9}\left(x\right)} \tag{16}$$

$$\cos\left(x\right) \tag{17}$$

$$\cot\left(\ln\left(\tan\left(x\right)\right)\right) \tag{18}$$

$$\cot\left(\csc\left(\ln\left(x\right)\right)\right) \tag{19}$$

$$\sin\left(\cot\left(\tan\left(x\right)\right)\right) \tag{20}$$

2 Matrices

Calculate the inverse of the following:

$$\begin{bmatrix}-6 & -3 & -3\\ -9 & 9 & 3\\ 2 & -3 & -1\end{bmatrix} \tag{21}$$

$$\begin{bmatrix}-5 & 7 & -4\\ -2 & -7 & 3\\ 0 & 8 & 0\end{bmatrix} \tag{22}$$

$$\begin{bmatrix}1 & 6 & -9\\ 5 & -4 & 5\\ -1 & 7 & 9\end{bmatrix} \tag{23}$$

$$\begin{bmatrix}-2 & 8 & 1\\ -3 & -8 & -1\\ -2 & -5 & 6\end{bmatrix} \tag{24}$$

$$\begin{bmatrix}-2 & 5 & 6\\ 5 & 1 & -3\\ -5 & 6 & 2\end{bmatrix} \tag{25}$$

$$\begin{bmatrix}0 & 5 & 1\\ 8 & 5 & 4\\ 5 & 5 & 7\end{bmatrix} \tag{26}$$

$$\begin{bmatrix}-2 & 3 & 0\\ 1 & 7 & -5\\ 2 & 5 & -8\end{bmatrix} \tag{27}$$

$$\begin{bmatrix}5 & -1 & 1\\ 7 & 6 & -1\\ -5 & -8 & -3\end{bmatrix} \tag{28}$$

$$\begin{bmatrix}5 & 8 & 6\\ 1 & 7 & -4\\ 9 & 6 & -6\end{bmatrix} \tag{29}$$

$$\begin{bmatrix}-1 & 2 & 4\\ 3 & 9 & 6\\ 8 & -5 & 8\end{bmatrix} \tag{30}$$