1 Differenciation

Differenciate the following expressions:

$$-\tan\left(e^{x}+7\right) \tag{1}$$

$$\sec\left(\cos\left(\cos\left(x\right)\right)\right) \tag{2}$$

$$\csc\left(\cos\left(\ln\left(x\right)\right)\right) \tag{3}$$

$$\sin\left(\cot\left(\frac{1}{x}\right)\right) \tag{4}$$

$$\sin\left(\frac{1}{5x-3}\right) \tag{5}$$

$$\ln\left(7\cos\left(x\right)+5\right) \tag{6}$$

$$e^{\csc^{7}\left(x\right)} \tag{7}$$

$$-e^{\frac{1}{x^{10}}}-8 \tag{8}$$

$$\frac{1}{\cos\left(\cos\left(x\right)\right)} \tag{9}$$

$$e^{e^{\sin\left(x\right)}} \tag{10}$$

$$\cot\left(\cos\left(\ln\left(x\right)\right)\right) \tag{11}$$

$$\tan\left(\frac{1}{\sin\left(x\right)}\right) \tag{12}$$

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

$$\sin\left(\frac{1}{6x-5}\right) \tag{14}$$

$$56\tan\left(x\right)+53 \tag{15}$$

$$\sin\left(\tan\left(\sin\left(x\right)\right)\right) \tag{16}$$

$$e^{\sin\left(\tan\left(x\right)\right)} \tag{17}$$

$$\sec\left(\cos\left(\ln\left(x\right)\right)\right) \tag{18}$$

$$\sin\left(\cos\left(2x+2\right)\right) \tag{19}$$

$$-10e^{\cos\left(x\right)}-5 \tag{20}$$

2 Matrices

Calculate the inverse of the following:

$$\begin{bmatrix} 5 & 1 & 9 \\ 5 & -9 & 0 \\ -1 & 6 & -5 \end{bmatrix} \tag{21}$$

$$\begin{bmatrix} 5 & -8 & 2 \\ 1 & 0 & -2 \\ -2 & 7 & -4 \end{bmatrix} \tag{22}$$

$$\begin{bmatrix} 3 & 3 & 9 \\ 4 & -9 & 7 \\ -3 & -9 & 0 \end{bmatrix} \tag{23}$$

$$\begin{bmatrix} 3 & 0 & 3 \\ 1 & 0 & 5 \\ -9 & -2 & -4 \end{bmatrix} \tag{24}$$

$$\begin{bmatrix} -2 & 4 & -5 \\ -8 & 1 & -9 \\ 4 & 3 & 5 \end{bmatrix} \tag{25}$$

$$\begin{bmatrix} 0 & -8 & 8 \\ 5 & 9 & 6 \\ 0 & 2 & 3 \end{bmatrix} \tag{26}$$

$$\begin{bmatrix} 1 & 0 & -7 \\ -6 & -4 & 1 \\ -1 & -9 & 7 \end{bmatrix} \tag{27}$$

$$\begin{bmatrix} 5 & 7 & 2 \\ 4 & 3 & 3 \\ 0 & 6 & 9 \end{bmatrix} \tag{28}$$

$$\begin{bmatrix} 5 & 8 & 5 \\ 0 & 8 & 8 \\ -9 & 4 & 7 \end{bmatrix} \tag{29}$$

$$\begin{bmatrix} -9 & -6 & 8 \\ 2 & 7 & 7 \\ 9 & 3 & -1 \end{bmatrix} \tag{30}$$