Maths Revision Test 1

Time : 60 mins

Max Marks : 30

Q1. Solve the following

If $A = \begin{pmatrix} 3 & 2 \\ 1 & -1 \end{pmatrix}$, then $|3A|$ equals :

The value of $(x+y)$ if $2\begin{bmatrix} 1 & 3 \\ 0 & x \end{bmatrix} + \begin{bmatrix} y & 0 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 8 \end{bmatrix}$ is :

2 marks

Q2. Find

If $y = e^x \sin x$, then $\frac{dy}{dx}$ equals :

Find X and Y if $X + Y = \begin{bmatrix} 5 & 2 \\ 0 & 9 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 6 \\ 0 & -1 \end{bmatrix}$.

2 marks

Q3. Prove that

$$\lim_{x \to 2}\left(\frac{\sqrt{3-x}-1}{(2-x)}\right) = \frac{1}{2}.$$

3 marks

Q4

If $y = e^x \sin x$, show that $\frac{d^2y}{dx^2} = 2e^x \cos x$.

3 marks

Q5

Find the value(s) of k if the following function $f(x)$ is continuous at $x = \frac{\pi}{2}$:

$$f(x) = \begin{cases} \frac{k \cos x}{\pi - 2x}, & x \neq \frac{\pi}{2} \\ 3, & x = \frac{\pi}{2} \end{cases}$$

3 marks

Q6.

If $y = \left(x + \frac{1}{x}\right)^x + \frac{x^2 + 1}{x^2 - 1}$, find $\frac{dy}{dx}$.

3 marks

Q7.

Find the adjoint of the matrix $A = \begin{pmatrix} 4 & -2 & -1 \\ 1 & 1 & -1 \\ -1 & 2 & 4 \end{pmatrix}$ and show that $A(\text{adj } A) = |A|I$.

3 marks

Q8.

Prove that $2\tan^{-1}\sqrt{x} = \cos^{-1}\left(\frac{1-x}{1+x}\right)$

3 marks

Q9.

Find $\frac{dy}{dx}$ if $y = e^{2x^2 \sin 2x}$.

4 marks

Q 10

If $y = \sin\left(3\sin^{-1}x\right)$, then $\frac{dy}{dx}$ is equal to

4 marks