The given functions $f_1(x) = 5, f_2(x) = \cos^2 x, f_3(x) = \sin^2 x$ are linearly independent.

T

F

Question No: 5 **Marks: 2**

A set of functions whose wronskian is zero then set of functions may or may not be dependent.

T

F

Question No: 6 **Marks: 10**

(a) Define separable form. Just separate the variables of the given differential equation. $\sec y \frac{dy}{dx} + \sin(x-y) = \sin(x+y)$

Solution

The differential equation of the form d y / d x = f (x, y) is called **separable** if it can be written in the form

d y / d x = h(x)g(y)

$$\sec y \frac{dy}{dx} + \sin(x-y) = \sin(x+y)$$

$$\sec y \frac{dy}{dx} = \sin(x+y) - \sin(x-y)$$

$$\sec y \frac{dy}{dx} = \sin(x+y) - \sin(x-y)$$

$$\sec y \frac{dy}{dx} = \sin x \cos y + \cos x \sin y - \sin x \cos y + \cos x \sin y$$

$$\sec y \frac{dy}{dx} = 2\cos x \sin y$$

$$\frac{dy}{2\cos y \sin y} = \cos x dx$$

$$\frac{dy}{\sin 2y} = \cos x dx$$

$$\operatorname{cosec} 2y dy = \cos x dx$$

(b) Check whether the given differential equation is exact or not if not then make it exact also show that it is exact **(Just make the equation exact do not solve it further)**.

$$e^x dx + (e^x \cot y + 2y \operatorname{cosec} y)\, dy = 0$$

Solution

Scanned with CamScanner