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вид обучение-заочно дата на изпита-26.04.2022г изпитна
дисциплина-ВМ2

$$a = 5$$

$$b = 0$$

$$c = 1$$

$$l = -1 \quad m = 1$$

задача 3.

$$ly'' + ay' + my = 0$$

$$-1y'' + 5y' + 1y = 0$$

$$-1t^2 + 5t + 1t = 0$$

$$a = -1 \quad b = 5 \quad c = 1$$

$$D = 5^2 - 4 \cdot (-1) \cdot 1 = 29$$

$$t_{1,2} = \frac{-5 \pm \sqrt{29}}{2 \cdot (-1)} = \frac{-5 \pm \sqrt{29}}{-2} = \frac{5}{2}$$

$$Y = (Ax + B)e^{\frac{5}{2}}$$

Задача 2.

$$f(x, y) = y^{l+a}(b \operatorname{arctg} x + (1 - b) \arcsin x)$$

$$f(x, y) = y^4(0 \cdot \operatorname{arctg} x + (1) \arcsin x)$$

$$f(x, y) = y^4 \arcsin x$$

$$f_x = y^4 \frac{1}{\sqrt{1-x^2}}$$

$$f_y = 4y^3 \arcsin x$$

$$\left(\frac{1}{\sqrt{1-x^2}}\right)' = \left(\frac{1}{(1-x^2)^{\frac{1}{2}}}\right)' = \left((1-x^2)^{-\frac{1}{2}}\right)' =$$

$$= -\frac{1}{2}(1-x^2)^{-\frac{1}{2}-1}(1-x^2)' = -\frac{1}{2}(1-x^2)^{-\frac{3}{2}}(-2x) = \frac{x}{(1-x^2)^{\frac{3}{2}}}$$

$$f_{xx} = y^4 \left(\frac{1}{\sqrt{1-x^2}} \right)_x = y^4 \frac{x}{(1-x^2)^{\frac{3}{2}}}$$

$$f_{xy} = \left(y^4 \frac{1}{\sqrt{1-x^2}} \right)_y = 4y^3 \frac{1}{\sqrt{1-x^2}} = 24y \cdot \frac{1}{\sqrt{1-x^2}} = \frac{24}{\sqrt{1-x^2}}$$

$$f_{yy} = (4y^3 \arcsin x)_y = \frac{24}{\sqrt{1-x^2}} \arcsin x$$

Задача 1.

$$\int \left(\left(l + \frac{1}{2} \right) x + m \right) \sin(b+1)x \, dx$$

$$\int \left(\left(-1\frac{1}{2} \right) x + 1 \right) \sin(1)x \, dx$$

$$I = \int \left(-\frac{1}{2} \right) (x+1) \sin(x+1) \, d(x+1) =$$

$$I = \int \left(-\frac{1}{2} \right) (x+1) - \cos(x+1) + C = \frac{1}{2} \cos x + C$$