MATHS

BOOKS - RESONANCE DPP ENGLISH

DIFFERENTIAL EQUATIONS

Others

1. If $F(x) = f(x)g(\dot{x})$ and $f'(x)\dot{g}'(x) = c$, prove that $\frac{F''}{F} = \frac{f''}{f} + \frac{g''}{g} + \frac{2c}{fg} \& \frac{F'''}{F} = \frac{f'''}{f} + \frac{g'''}{g}$

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2. The degree of the differential equation, $e^{\left(\frac{d^3y}{dx^3}\right)^2} + x\frac{d^2y}{dx^2} + y = 0$ is 1

(b) 2 (c) 0 (d) not defined

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3. The order of the differential equation whose general solution is $y = c_1 \cos 2x + c_2 \cos^2 x + c_3 \sin^2 x + c_4$ is

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4. The two curves $x = y^2, xy = a^3$ cut orthogonally at a point. Then a^2 is equal to $\frac{1}{3}$ (b) 3 (c) 2 (d) $\frac{1}{2}$

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5. A curve C passes through (2,0) and the slope at (x, y) as $\frac{(x+1)^2 + (y-3)}{x+1}$. Find the equation of the curve. Find the area bounded by curve and x-axis in the fourth quadrant.

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6. Identify the statement(s) which is/are true. (a) $(b)(c)f((d)(e)x, y(f)) = (g)e^{(h)\,(i)\,(j)\,\frac{y}{k}x\,(l)\,(m)\,(n)}(o) + \tan(p)\frac{y}{q}x(r)(s)$ (u) is a homogeneous of degree zero. (v) *[Math Processing Error]* (ww) is a homogeneous differential equation. (xx) *[Math Processing Error]* (iii) is a non=homogeneous. (jjj) $(kkk)(lll)\left((mmm)\left(\bigcap\right)(\infty o)x^{(ppp)\,2\,(qqq)}(rrr) + (sss)y^{(ttt)\,2\,(uuu)}(vvv)\right.$ (gggg) is a homogeneous differential equation.

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7. The solution of the differential equation $\frac{x^2dy}{dx}\cos\left(\frac{1}{x}\right) - y\sin\left(\frac{1}{x}\right) = -1$, where $y \to 1$as $x \to \infty$ is (A) $y = \sin\left(\frac{1}{x}\right) + \cos\left(\frac{1}{x}\right)$ (B) $y = \frac{x+1}{x\sin\left(\frac{1}{x}\right)}$ (C) $y = \sin\left(\frac{1}{x}\right) - \cos\left(\frac{1}{x}\right)$ (D) $y = \frac{x}{x\cos\left(\frac{1}{x}\right)}$

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8. The solution of differential equation $(1+y^2)+\frac{\left(x-2e^{\tan\hat{}((-1)y)}\right)dy}{dx}=0$ is

$(x-2)=ke^{\tan\hat{}((-1)y)}$ $xe^{t}an-1y=e^{2}\tan^{(-4)y}+k$

$xe^{\tan\hat{}((-1)y)}=\tan^{-1}y+k$ $xe^{2}\tan^{(-1)y}=e^{2}\tan^{(-1)y}+k$

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9. The solution of the differential equation $(x+y)^2\frac{dy}{dx}=1$, satisfying the condition $y(1)=0$ is (A) $y+\frac{\pi}{4}=\tan^{-1}(x+y)$ (B) $y-\frac{\pi}{4}=\tan^{-1}(x+y)$ (C) $y=\tan^{-1}x$ (D) $y=\tan^{-1}(\ln x)+1$

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