

Πρώτο Φυλλάδιο Ασκήσεων

Άσκηση 1

Να λυθούν οι παρακάτω διαφορικές εξισώσεις

1. $xy^3y' = y^4 + x^4$
2. $x^2y' + 3xy = e^x$
3. $y' = \frac{3x^2+2x+1}{y-2}$
4. $y' = \frac{y+x}{x}$
5. $xy' + 2y = \frac{2}{x^2} + 1$
6. $x^2yy' = (y^2 - 1)^{\frac{3}{2}}$
7. $(\sin x)(\sin y) + (\cos y)y' = 0$
8. $x^2y' = xy + x^2 + y^2$
9. $(1+x)y' + 2y = \frac{\sin x}{1+x}$
10. $y' = \frac{y^2+2xy}{x^2}$

Άσκηση 2

Να λυθούν τα παρακάτω ΠΑΤ

1. $(1+x^2)y' + 4xy = \frac{2}{1+x^2}, y(0) = 1$
2. $y' = \frac{2x}{1+2y}, y(2) = 0$
3. $xyy' + x^2 + y^2 = 0, y(1) = 2$
4. $y' = -2x(y^2 - 3y + 2), y(0) = 3$
5. $y' = \frac{x^3+y^3}{xy^2}, y(1) = 3$
6. $y' + (\cot x)y = \cos x, y\left(\frac{\pi}{2}\right) = 1$
7. $y' = 2y - y^2, y(0) = 1$
8. $xy' + 2y = 8x^2, y(1) = 3$