

PROBLEM SET 23: LINEAR DIFFERENTIAL EQUATIONS

Note: Most of the problems were taken from the textbook [1].

Problem 1. *Solve the differential equations.*

a) $xy' + y = \sqrt{x}$;

b) $t^2 \frac{dy}{dt} + 3ty = \sqrt{1+t^2}$, $t > 0$.

Problem 2. *Solve the initial-value problem.*

a) $x^2y' + 2xy = \ln x$, $y(1) = 2$;

b) $xy' + y = x \ln x$, $y(1) = 0$;

c) $xy' = y + x^2 \sin x$, $y(\pi) = 0$.

REFERENCES

- [1] J. Stewart: *Single Variable Calculus* 8th Edition, Cengage Learning, Boston 2015.