

Physics 201

Problem Set (1)

Problem (1)

In each part, determine whether the equation is linear in x_1 , x_2 , and x_3 .

(a) $x_1 + 5x_2 - \sqrt{2x_3} = 1$

(b) $x_1 + 3x_2 + x_1x_3 = 2$

(c) $x_1 = -7x_2 + 3x_3$

(d) $x_1^{-2} + x_2 + 8x_3 = 5$

(e) $x_1^{3/5} - 2x_2 + x_3 = 4$

(f) $\pi x_1 - \sqrt{2x_2} + \frac{1}{3}x_3 = 7^{1/3}$

Problem (2)

Solve the system.

$$\begin{array}{rcl} x_2 - x_3 & = & 0 \\ x_1 - 3x_3 & = & -1 \\ -x_1 + 3x_2 & = & 1 \end{array}$$

Problem (3)

Solve the system.

$$\begin{array}{rcl} x_1 - 3x_2 + x_3 & = & 1 \\ 2x_1 - x_2 - 2x_3 & = & 2 \\ x_1 + 2x_2 - 3x_3 & = & -1 \end{array}$$

Problem (4)

Solve the system.

$$\begin{aligned}x - 2y + 3z &= 9 \\ -x + 3y &= -4 \\ 2x - 5y + 5z &= 17\end{aligned}$$

Problem (5)

Determine whether the linear systems on problems 2, 3 and 4 are consistent or inconsistent.

Problem (6)

Solve the system

$$\begin{aligned}2x + y &= 1, \\ x + 2y &= -1, \\ x - y &= 2.\end{aligned}$$

Problem (7)

Solve the system

$$\begin{aligned}x + y + z &= 1, \\ x + 2y + 2z &= 1, \\ x - y + z &= 3.\end{aligned}$$