**Problem 1**

Ans2) y1(x) = 52.1581x -189.866 y2(x) = 7.00158x2 + 9.30386x -239.334, y3(x) = 0.820138x3 + 0.261767x2 -0.0103277x -175.277, y4(x) = 0.00598796x4 + 0.755218x3 + 0.234560x2 + 1.17636x -175.880, y5(x) = 0.00085312x5 -0.00469804x4 + 0.752811x3 + 0.526085x2 + 0.965916x -176.837

Ans3)

Chart, line chart

Description automatically generatedChart, line chart

Description automatically generated

The relationship seems to follow a relationship of degree 3 (cubic). This result can be deduced by observing the graphs above. To ensure generalizability, d= 2 and d= 1 was ruled out as both the models deviate from covering array of values. Lastly, to avoid overfitting, d =4 and d=3 were observed and it was deduced that d =3 represented the same graph as d= 4 and d=5. Hence, the polynomial of order 3 was selected for the model.

Ans4)

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Y(predicted) = -173.13384539999998

**Problem 2**

Ans6)

Chart, line chart

Description automatically generated

Ans7)

y(predicted) = 5115.65136992x1 - 201.49769618 x2 -207.15474973x3 -1338.29096939x4

+ 219.18597862 x5 -66.36405012 x6 +500.9098275 x7 + 74.30622797 x8

-459.07248485 x9 + 3928.07687554

Ans8) $ 437.28161954