

Create the Matlab programs that solve the problems below and upload them to Canvas. More detailed instructions are on the class plan.

Problem 1

The radioactive decay of an isotope can be modeled using the equation:

$$A = A_0 e^{-t/k}$$

where A_0 is the initial amount of the isotope and k is the decay rate. Write a Matlab program that generates a professional plot of the quantity A over a period of 5 *hr*. Use $k = 1.48$ *hr* and $A_0 = 10$ *g*.

Note: do not use the function `fplot()`.

Problem 2

Write a Matlab program that generates a professional plot of the following dataset:

Diameter (D) [ft]	0.5	0.75	1	1.5	2	2.25	2.5	2.75
Power (P) [hp]	0.004	0.04	0.13	0.65	3	8	18	22

where the diameter is the abscissa (x-axis) and the power is the ordinate (y-axis). Assume the data is experimental.

Problem 3

You are helping design the braking system for a new car and need to make a presentation about the current system. You run an experiment in which a driver needs to suddenly stop after observing a pedestrian in the road ahead. The following data shows the experimental data you collected showing the distance traveled by the car during two time periods. The reaction distance (d_r) is the distance traveled after the pedestrian is observed but before the driver presses the brake. The brake distance (d_b) is the distance traveled during the deceleration of the vehicle. Write a Matlab program that produces a professional plot the data:

Vehicle Speed (v) [mph]	Reaction (d_r)	Braking (d_b)
20	6	6
30	9	14
40	12	24
50	15	38
60	18	55
70	21	75