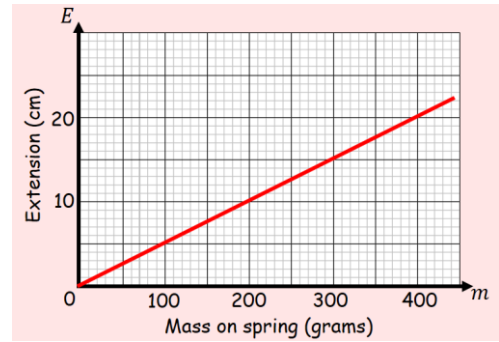# 5H Questions in Context

1. The graph shows the extension, E, of a spring where different masses, m, are attached to the end of the spring.

a) Calculate the gradient, k, of the line

b) Write an equation linking E and m

c) Explain what the value of k represents in this context

2. A container was filled with water. A hole was then made at the bottom of the container. The depth of the water was recorded at various time intervals, and the table shows the results.

Time, t seconds	0	10	30	60	100	120
Depth, d cm	19.1	17.8	15.2	11.3	6.1	3.5

a) Determine whether a linear model is appropriate, by drawing a graph
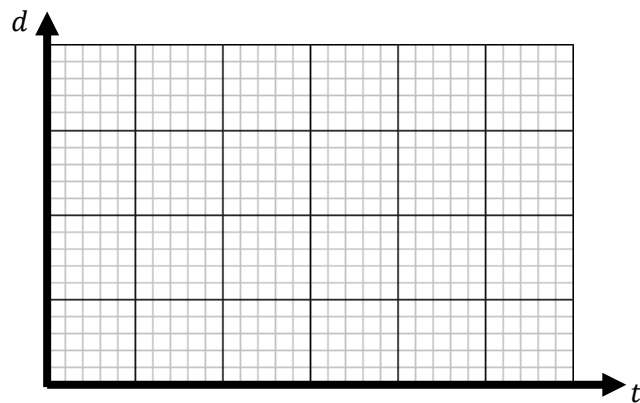
b) Deduce an equation in the form $d = at + b$

c) Interpret the meaning of the coefficients a and b

d) Use the model to estimate when the container will be empty

3. In 1991 there were 18,500 people living in Bradley Stoke. Planners project that the number of people living in Bradley Stoke would increase by 350 each year.

a) Write down a linear model for the population p of Bradley Stoke t years after 1991

b) Write down one reason why this may not be a realistic model