5.5) Modelling with straight lines

| Worked example	Your turn
The A Level Maths mark, y %, and GCSE Maths mark, x %, is recorded for several students. Assume the line goes through $(0, 40)$ and $(60, 80)$. a) Write a linear model b) Interpret the gradient and y-intercept in this context c) Predict the A Level Maths mark of a student who got 100% for their GCSE Maths mark	The temperature y at different points on a mountain is recorded at different altitudes x. Assume the line goes through $(0, 70)$ and $(250, 20)$. a) Write a linear model b) Interpret the gradient and y-intercept in this context c) Predict at what altitude the temperature reaches $0°F$
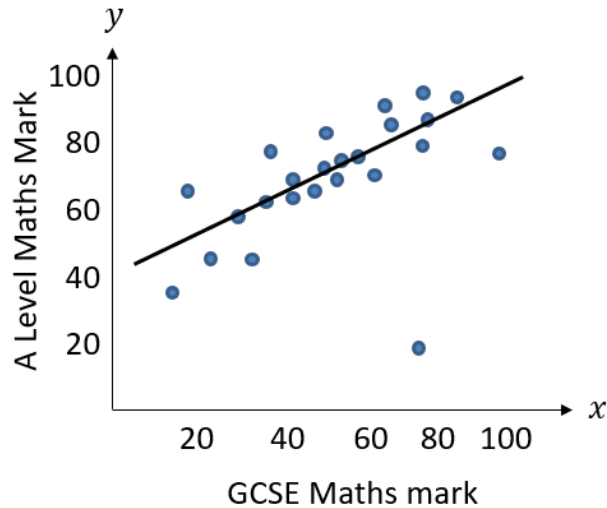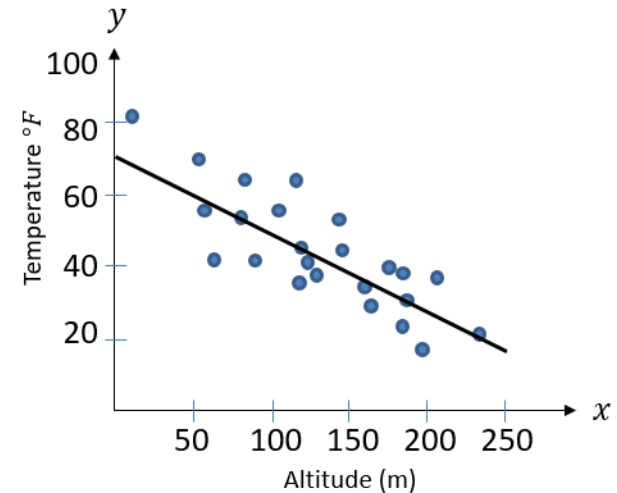
a) $y = 0.2x + 70$
b) The temperature at sea level is $70°F$. The temperature decreases by $0.2°F$ for each extra metre in altitude.
c) $350 \, m$

Worked example	Your turn
In 2010 the population of rabbits in an area was 200. Locals projected that the number of rabbits would increase by 4 per year. a) Write a linear model for the population, p, of rabbits t years after 2010 b) Write down a reason why this might not be a realistic model.	In 2000 there were 18500 people in a village. Planners projected that the number of people living in the village would increase by 350 per year. a) Write a linear model for the population, p, of the village t years after 2000 b) Write down a reason why this might not be a realistic model.

a) $p = 350t + 18500$
b) The population is unlikely to increase by the same amount each year. An exponential model would be more suitable