Daily Question – Pure Mathematics - Day 12

Topic : Modelling Logarithms/Exponentials

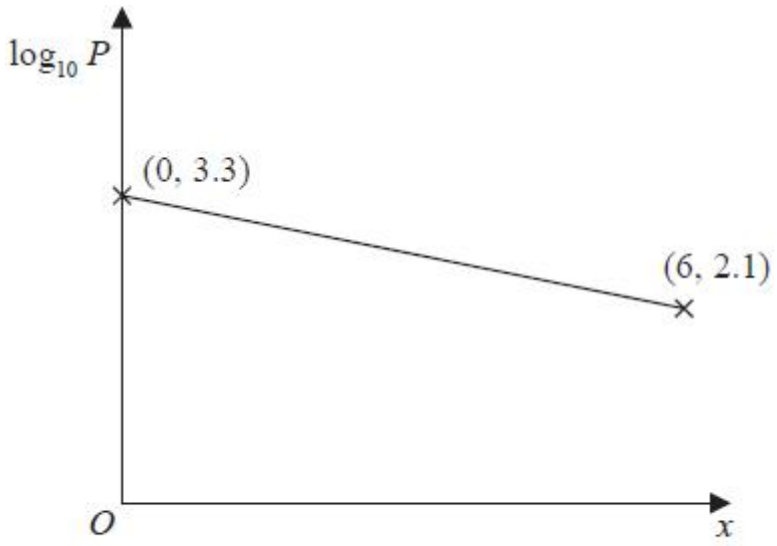

Figure 2

A chimney emits smoke particles.

On a particular day, the concentration of smoke particles in the air emitted by this chimney, P parts per million, is measured at various distances, x km, from the chimney.

Figure 2 shows a sketch of the linear relationship between $\log_{10}P$ and x that is used to model this situation.

The line passes through the point (0, 3.3) and the point (6, 2.1)

(a) Find a complete equation for the model in the form

$$P = ab^x$$

where a and b are constants. Give the value of a and the value of b each to 4 significant figures.

(4)

(b) With reference to the model, interpret the value of ab

(1)

(Total for question = 5 marks)