

- 9 (a) Define half-life of a radioactive isotope.

.....
.....
..... [1]

- (b) Radioactive isotope X decays to isotope Y.

A sample contains only nuclei of X at time $t = 0$. Fig. 9.1 shows the variation with t of the numbers of nuclei of X and of Y as the sample decays.

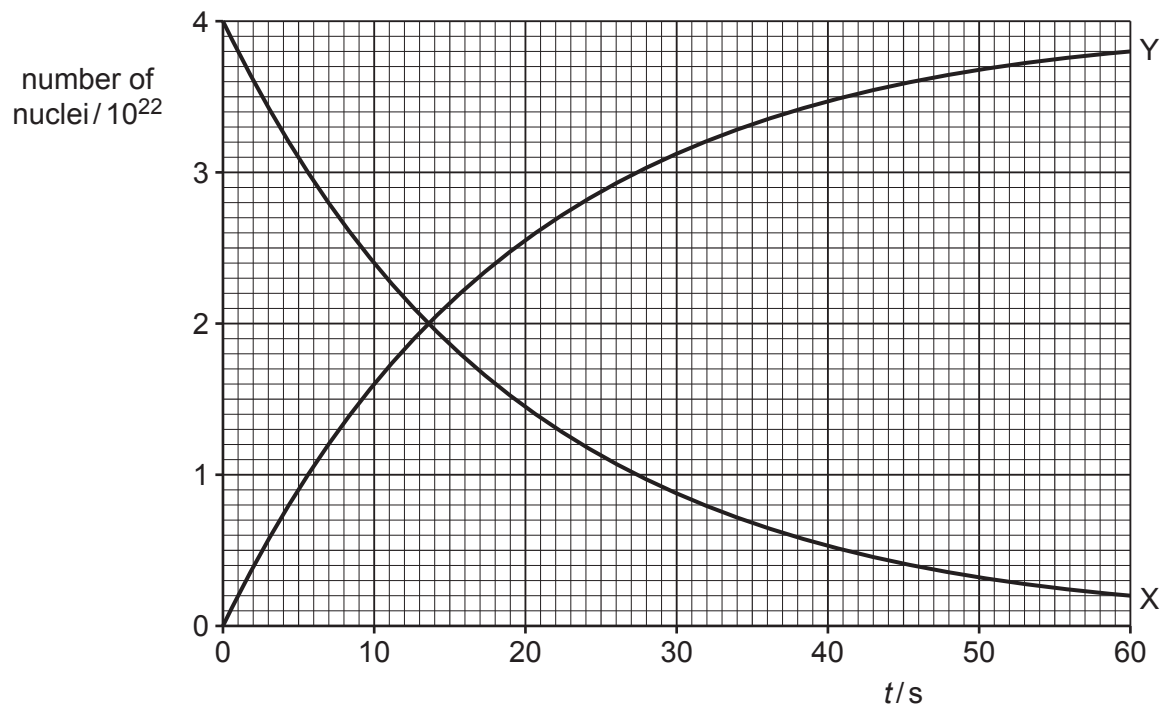


Fig. 9.1

- (i) State the name of the quantity represented by the magnitude of the gradient of line X in Fig. 9.1.

..... [1]

- (ii) State **three** conclusions about X or Y that may be drawn from Fig. 9.1. The conclusions may be qualitative or quantitative. Use the space below for any working that you need.

1

.....

2

.....

3

.....

[3]

- (c) The mass of radioactive isotope X in the sample in (b) is 7.3×10^{-4} kg at time $t = 0$.

Determine the nucleon number of isotope X.

nucleon number = [3]