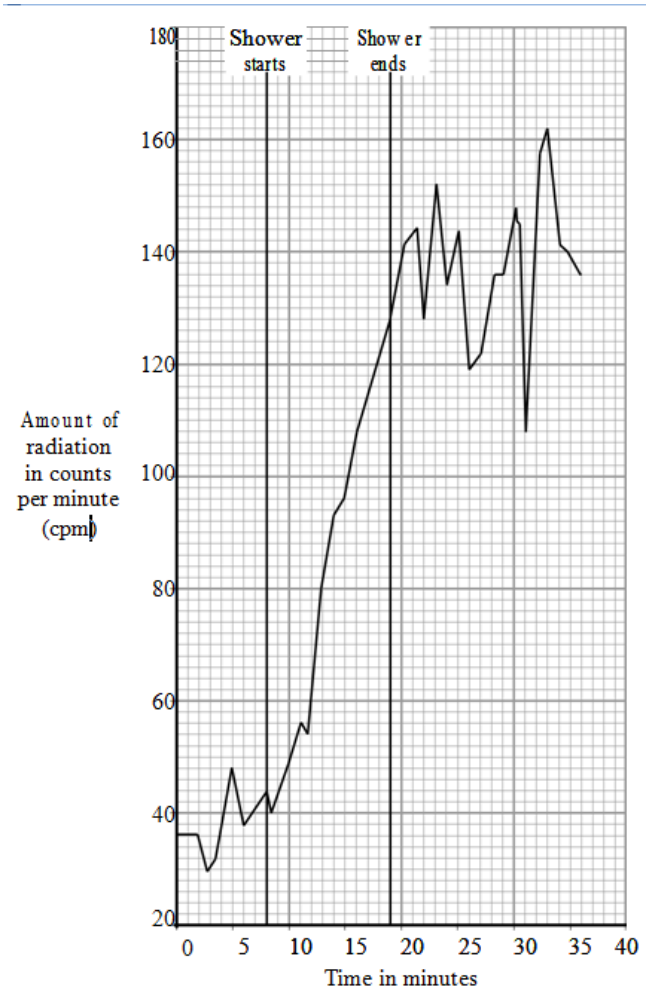
Half Life 3

Q:1 The graph shows how the amount of radiation from radon varies in the bathroom of a house.



Match figures, A, B, C and D, with the numbers 1–4 in the table.

A 11

B 33

C 44

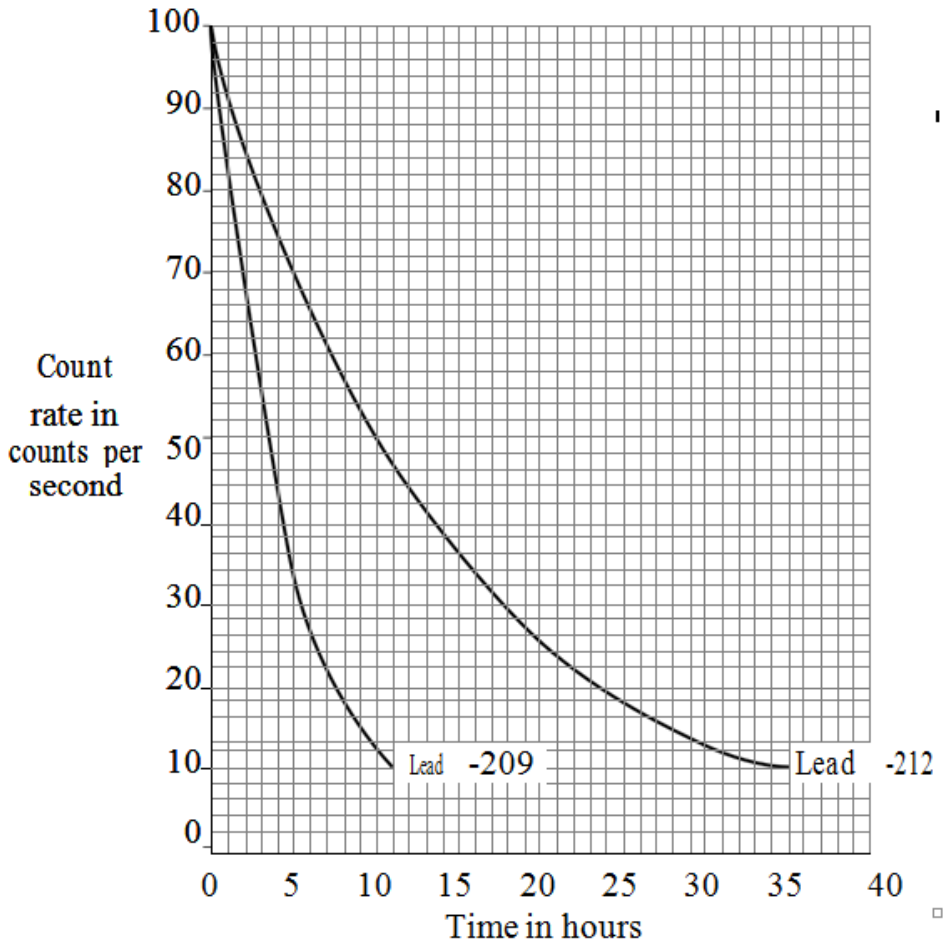
D 84

1	the length of time of the shower in minutes
2	the amount of radiation at the start of the shower in cpm
3	the time at which the radiation in the bathroom reaches a maximum
4	the rise in the amount of radiation during the shower in cpm

Q:2 The graph shows the radioactive decay of two isotopes of lead.

In lead-209, the total number of protons and neutrons is 209.

In lead-212, the total number of protons and neutrons is 212.



Match values, A, B, C and D, with the numbers 1– 4 in the sentences.

A 3

B 10

C 12

D 60

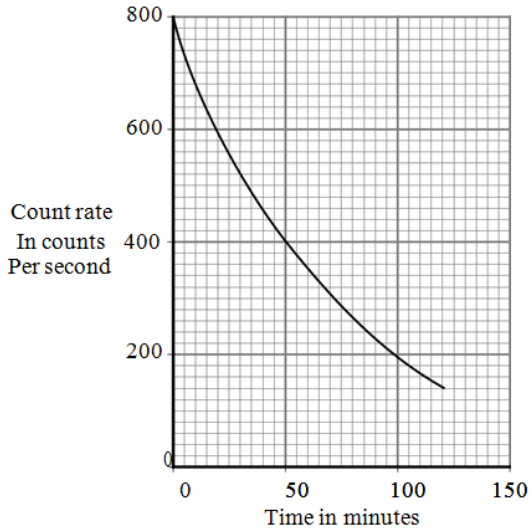
The half-life of lead-212 is . . . 1 . . . hours.

After 10 hours, the count rate of lead-209 is . . . 2 . . . counts per second.

When the count rate of lead-209 has dropped to 20 counts per second, the count rate of lead-212 has dropped to . . . 3 . . . counts per second.

Lead-212 has . . . 4 . . . more neutrons than lead-209.

Q:3 The graph shows how the count rate of a radioactive substance changes with time.



Match figures, A, B, C and D, with the statements 1– 4 in the table.

A 50

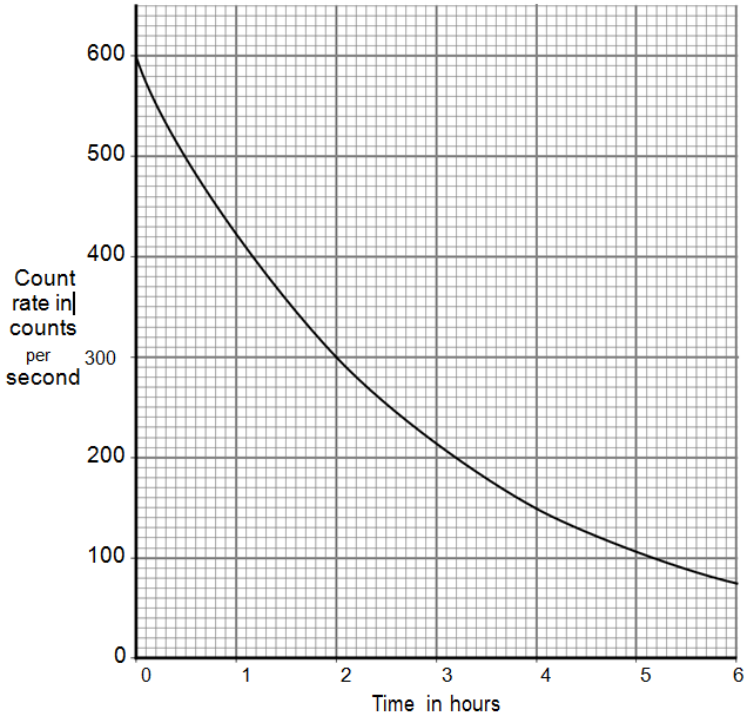
B 100

C 400

D 800

1	the initial count rate of the substance
2	the count rate after one half-life
3	the half-life of the substance in minutes
4	the count rate after three half-lives

Q:4 The graph shows the count rate of a radioactive source over 6 hours.



Match values, A, B, C and D, with the numbers 1– 4 in the table.

A 2

B 6

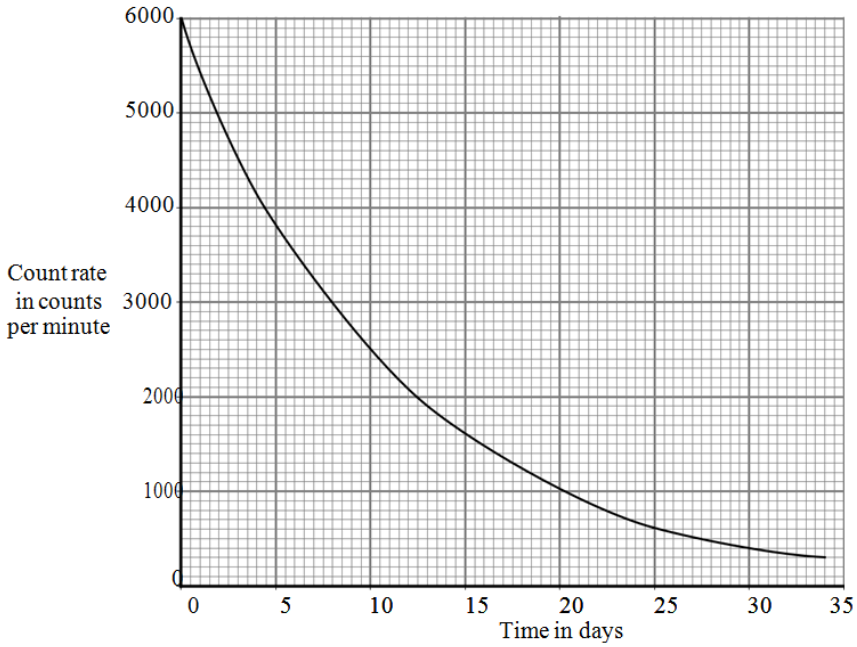
C 150

D 600

1	the initial count rate in counts per second
2	the count rate, in counts per second, after 4 hours
3	the number of hours it took the count rate to fall to 75 counts per second
4	the number of hours it took the count rate to halve

Q:5 Iodine-131 is a radioactive isotope. It is used in hospitals.

The graph shows how the count rate of a sample of iodine-131 changes with time.



Match figures, A, B, C and D, with the numbers 1–4 in the sentences.

A 4.5

B 8

C 24

D 400

The count rate after 30 days is . . . 1 . . . counts per minute.

The time taken for the count rate to fall to 4000 counts per minute is . . . 2 . . . days.

The half-life of iodine-131 is . . . 3 . . . days.

A patient is given 16 mg of iodine-131. This will decay to 2 mg in . . . 4 . . . days.

Q:6 This question is about a radioactive isotope that emits alpha particles.

Match words, A, B, C and D, with the descriptions 1– 4 in the table.

A count rate

B half-life

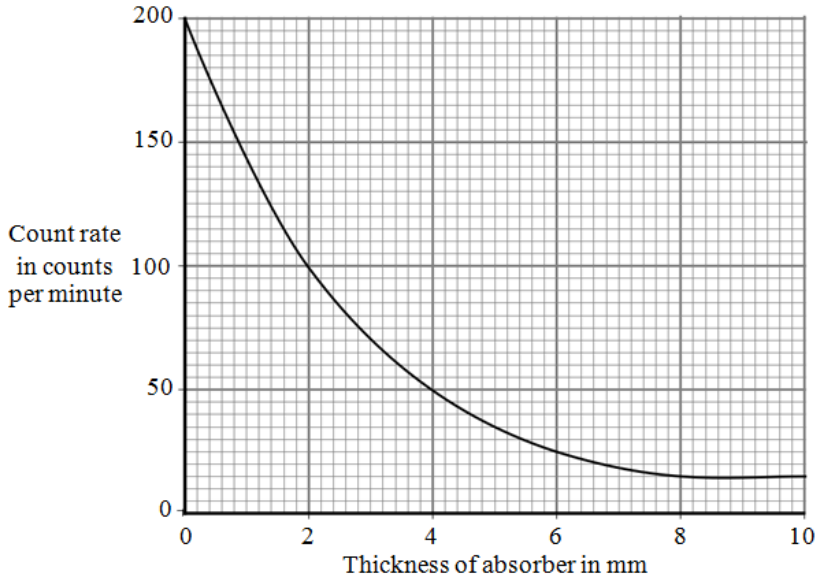
C penetrating power

D range

	Description
1	the number of alpha particles detected per second
2	the distance the alpha particles travel before being fully absorbed
3	the time it takes for half of the nuclei of the isotope to decay
4	the ability of the alpha particles to pass through matter

Q:7 A source of beta radiation is placed in front of a detector. Pieces of aluminium of different thicknesses are placed between the source and the detector. The thickness of the absorber and the count rate are measured.

The results are shown on the graph.



Match the figures, A, B, C and D, with the numbers 1– 4 in the sentences.

A 2

B 9

C 70

D 200

The count rate with no absorber is . . . 1 . . . counts per minute.

The count rate when the absorber is 3 mm thick is . . . 2 . . . counts per minute.

The thickness needed to reduce the count rate by half is . . . . 3 . . . mm.

The thickness needed to absorb all the radiation from the source is . . . 4 . . . mm.

TOTAL MARKS=28