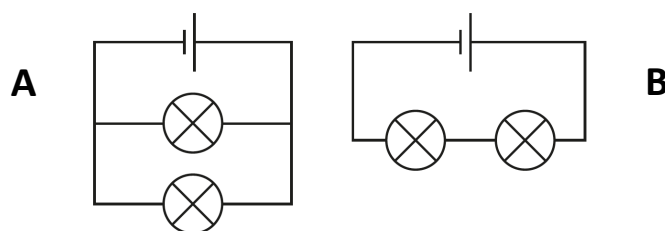


Name:

Class:



A student investigates if lamps are brighter in a series circuit or a parallel circuit. He sets up two different circuits, A and B.



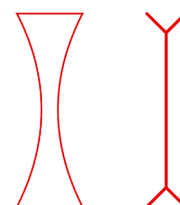
- i. State which circuit will have the brightest lamps and explain why.
 The parallel circuit will have the brightest lamps.
 As each lamp in parallel has the full potential difference of the cell. Or that the lamps in series each have half the potential difference of the cell.
- ii. State **two** variables that the student needs to control to ensure the experiment is valid.
 Any **two** of the following:
 - Use the same lamps.
 - Use the same cell or use cells with the same potential difference.
 - Use the same number of lamps.
 - Use the same number of cells.

Explain what is meant by the half-life of a radioactive isotope.

The time taken for the number of radioactive nuclei in a sample to halve.

Accept: the time taken for the count rate (or activity) of a sample to fall to half its initial value.

In the space below draw the diagram **and** symbol for a concave lens.



Some isotopes of cobalt are radioactive.

The isotope cobalt-60 has the symbol:



The isotope cobalt-57 has the symbol:



- i. State the number of protons in a nucleus of Co-60
 Number of protons: **27**
- ii. Give **one similarity** and **one difference** between the nucleus of Co-57 and the nucleus of Co-60.
Similarity: The same number of protons / atomic number / they both have 27 protons.
Difference: Co-60 has 3 more neutrons / Co-60 has 33 neutrons and Co-57 has 30 neutrons / mass number is different.