

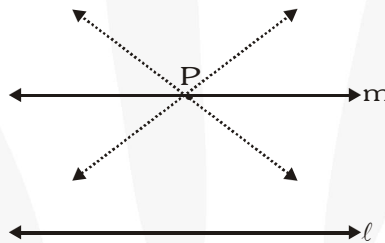
Ex - 5.2

Q1. How would you rewrite Euclid's fifth postulate so that it would be easier to understand ?

Sol. There are several easy equivalent versions of Euclid's fifth postulate. Playfair's axiom is one of the other equivalent versions of Euclid's fifth postulate which is easily understandable. According to it,

For every line l and for every point not lying on l , there exists a unique line m passing through point P and is parallel to l .

Clearly, if all lines passing through the point P , only line m is parallel to line l .



Other equivalent versions of Euclid's fifth postulate are as follows :

According to Poseidonios ; If two lines never meet no matter how much they are produced ; then they are equidistant. (100 B.C.)

According to Proclus ; The distance between a pair of parallel infinite straight lines (may fluctuate but) remain less than a certain fixed distance (5th century).

According to Clavius ; all the points equidistant from a given straight line, on a given side of it, constitute a straight line (1574).

Q2. Does Euclid's fifth postulate imply the existence of parallel lines ? Explain.

Sol. Yes. Euclid's fifth postulate is valid for parallelism of lines because if a straight line l falls on two straight lines m and n such that sum of the interior angles on one side of l is two right angles, then by Euclid's fifth postulate the line will not meet on this side of l . Next, you know that the sum of the interior angles on the other side of line l will also be two right angles. Therefore, they will not meet on the other side also. So, the lines m and n never meet and are therefore, parallel.

