Exercise 6.4

Question 5:

Prove that two lines that are respectively perpendicular to two intersecting lines intersect each other.

[**Hint:** Use proof by contradiction]

Answer 5:

Given:

Let lines *l* and *m* are two intersecting lines. Again, let *n* and *p* be another two lines which are perpendicular to the intersecting lines meet at point D.

To prove:

Two lines *n* and *p* intersecting at a point.

Proof:

Let us consider lines *n* and *p* are not intersecting, then it means they are parallel to each other i.e., $n \parallel p$. … (i)

Since, lines *n* and *p* are perpendicular to *m* and *l* respectively. But from equation (i), $n \parallel p$, it implies that $l \parallel m$. It is a contradiction.

Thus, our assumption is wrong.

Hence, lines *n* and *p* intersect at a point.