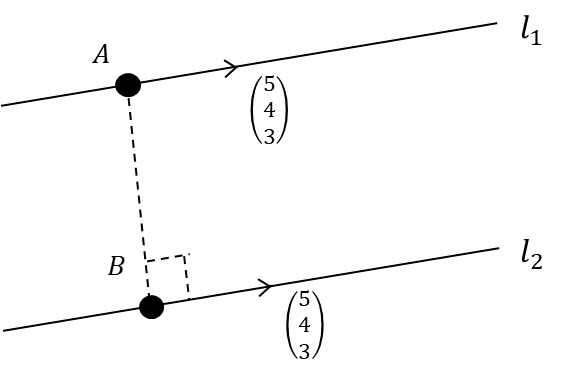
The Shortest Distance Between **Parallel** Lines

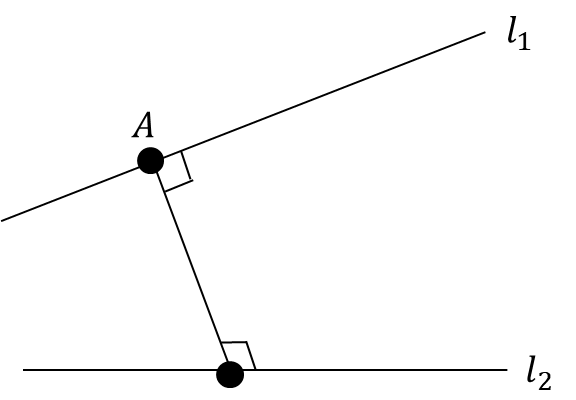
The key with such “shortest distance” problems is that the line connecting and whose distance is shortest, is perpendicular to the two lines.

Example

Show that the shortest distance between the parallel lines with equations:

and ,

Where and are scalars, is

The Shortest Distance Between **Any** Lines

Again, use same strategy, but this time is

perpendicular to **both** and .

Example

The lines and have equations and respectively, where and are scalars.

Find the shortest distance between these two lines.

The Shortest Distance Between a Point and a Line

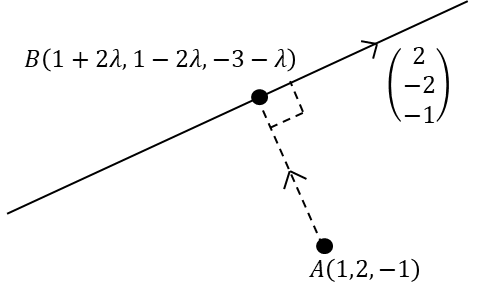
Again, same strategy! If is a point on the line, is perpendicular to the direction of the line.

Example

The line has equation , and the point has coordinates .

1. Find the shortest distance between and .

Find the Cartesian equation of the line that is perpendicular to and passes through



Ex 9F Q 1-5, 7, 9, 11