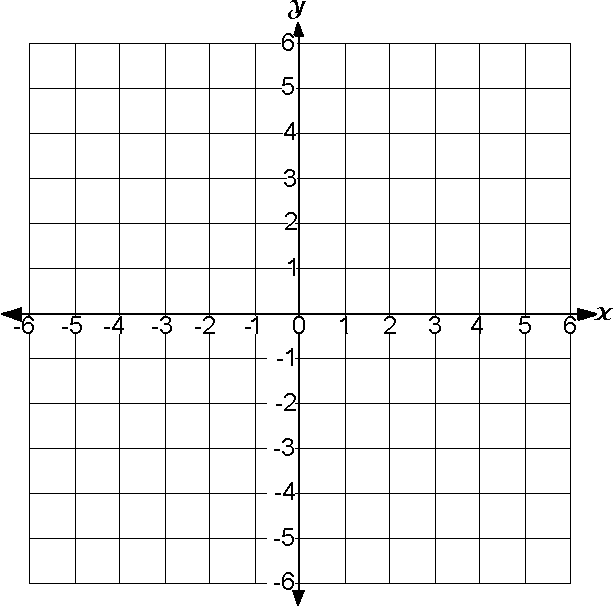
**Shortest Distance from a Point to a Line**

|  |
| --- |
| * Given the point we can draw infinite different lines to the line but… * The shortest distance is the line that hits it at a 0 * The shortest distance from a point to a line is the distance from the point to your line. |

**METHOD 1: Finding the Shortest Distance Graphically**

**Ex1.** Find the shortest distance **graphically** between the point and the equation .



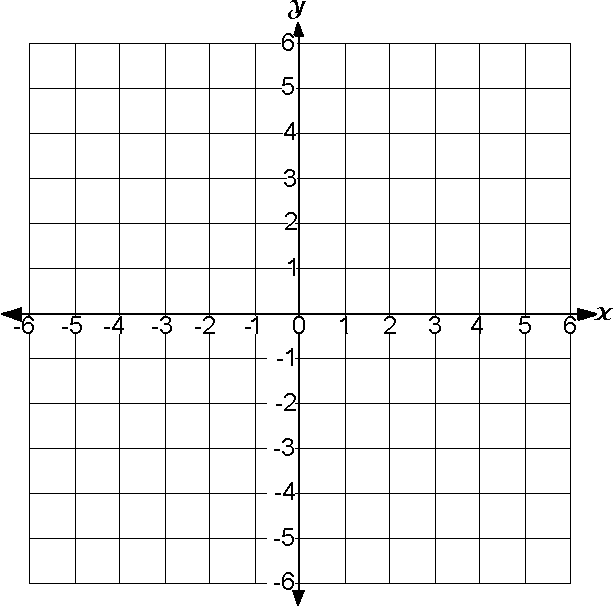
**METHOD 2: Finding the Shortest Distance Algebraically**

**Ex2.** Find the shortest distance from the point to the line passing through the points

|  |
| --- |
| **Step 1** Find equation of the line AB.  **Step 2** Draw a line perpendicular to AB that goes through C. Let the point on AB be called D. Find the equation of the line CD.  **Step 3** Find D, the POI of AB and CD (substitution or elimination).  **Step 4** Find the length of CD. |

**Practice**

**Ex3.** Determine the shortest distance **graphically** from to the line.



**Ex4**: **Algebraically** determine the shortest distance from the point to the line passing through the points

**Ex 5**.Triangle has vertices, and Determine an equation for , the **altitude** from to . What is the area of triangle?

An altitude of a triangle is .