Coordinate Geometry

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10^{th} Maths - Chapter 7

This is Problem-3 from Exercise 7.1

1. Determine if the points (1, 5), (2, 3) and (-2, -11) are collinear
   Solution:
   Distance formula
   d = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

We have to check that,
AB+BC=AC

A=(1,5)
B=(2,3)
C=(-2,-11)

AB=1,5,2,3
$AC = Let 1 be x_1, 5 be y_1, 2 be x_2 and 3 be y_2.$

AB=$\sqrt{(2-1)^2 + (3-5)^2}$
= $\sqrt{(1)^2 + (-2)^2}$
= $\sqrt{1+4}$
$AB = \sqrt{5}$

$BC = Let 2 be x_1, 3 be y_1, -2 be x_2 and -11 be y_2.$
BC=$\sqrt{(-2-2)^2 + (-11-3)^2}$

$= \sqrt{(-4)^2 + (-14)^2}$
$= \sqrt{16 + 196}$
$BC = \sqrt{212}$

$AC = Let 1 be x_1, 5 be y_1, -2 be x_2, -11 be y_2.$
AC= $\sqrt{(-2-1)^2 + (-11-5)^2}$
$= \sqrt{(-3)^2 + (-16)^2}$
$= \sqrt{9 + 256}$
$= \sqrt{265}$

$AB = \sqrt{5}$
$BC = \sqrt{212}$
$AC = \sqrt{265}$

$Hence, AB + BC \neq AC$
$Therefore, The points (1,5), (2,3) and (-2,-11) are not collinear points.$