Distance Worksheet 2 (25 points)

Name: _____

WS 2: Distance Formula and Concept – Word problems

Distance formula: Distance between (x_1, y_1) and (x_2, y_2)

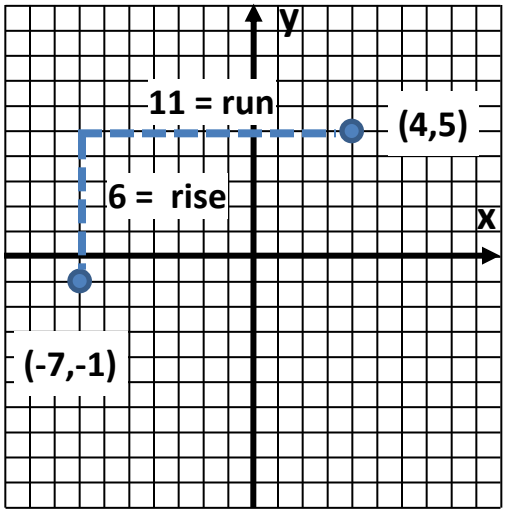
$$d = \sqrt{(x_2 - x_1)^2 + (x_2 - x_1)^2}$$

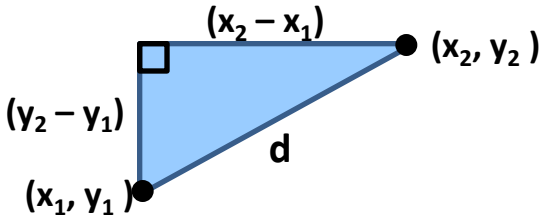
Alternate forms: $a^2 + b^2 = c^2$ or in slope terminology: $run^2 + rise^2 = distance^2$

Distance concept: Length of the line segment connecting those two locations or points

Word Problem: One group of hikers traveled 4 miles east and 5 miles north of the ranger station. Another group of hikers traveled 7 miles west and 1 mile south from the ranger station. How far apart were the two groups of hikers?

By graphing the locations of the hikers, using the origin as the ranger station, we get the graph on the left and the points. Then by using the points or a right triangle:





$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(4-(-7))^2 + (5-(-1))^2}$

$= \sqrt{(11)^2 + (6)^2}$

$= \sqrt{121 + 36} \quad = \sqrt{157} \quad = 12.53$

Pythagorean:

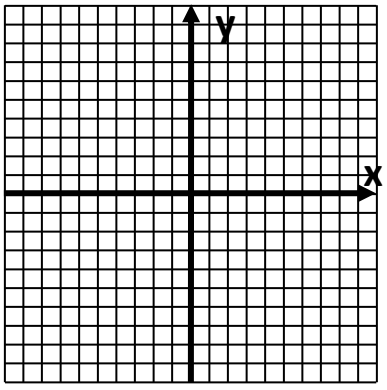
$d^2 = (11)^2 + (6)^2$

$= 121 + 36$

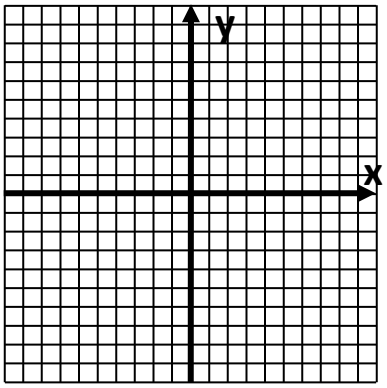
$d = \sqrt{157}$

$= 12.53$

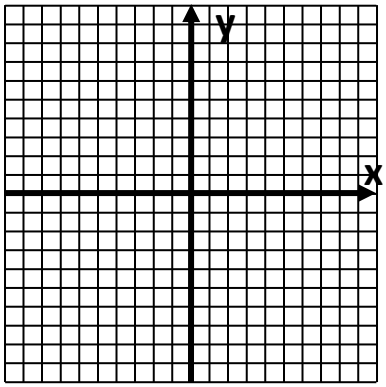
1. One group of hikers traveled 6 miles east and 2 miles north of the ranger station. Another group of hikers traveled 9 miles west and 5 miles south from the ranger station. How far apart were the two groups of hikers?



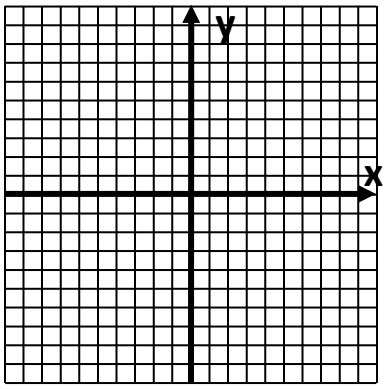
2. **One boat travel 6 miles north of the marina and another boat traveled 8 miles west of the marina. How far apart were the two boats?**



3. **One search team found their last debris 2 miles north and 4 miles east from the crash site. The other search team found their last debris 6 miles south and 3 miles west from the crash site. How wide was the debris field from the crash?**



4. **Mark's house is 4 miles north of school and Kallie's house is 6 miles west of school. How far apart is Mark's house from Kallie's?**



5. **Two meteors crashed near Roswell New Mexico. One hit 6 miles west and 3 miles north. The other hit 4 miles east and 8 miles south. How far apart were the meteor strikes?**