

# VECTOR ADDITION

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## World War II and the Ingredients of Slaughter

The spirit of certitude that dominated the politics of the 1930s is not so distant from us today.

World War II began 80 years ago this Sunday after Nazi Germany and the Soviet Union signed a “nonaggression” pact that was, in fact, a mutual aggression pact. Adolf Hitler invaded Poland on Sept. 1, 1939. Russia’s invasion of Poland, no less murderous, followed two weeks later. On Nov. 3 of that year, Joseph Goebbels, the propaganda minister, gave Hitler a report of his trip to Poland. “Above all, my description of the Jewish problem gets [Hitler’s] full approval,” he wrote in his diary. “The Jew is a waste product. It is a clinical issue more than a social one.” The (relatively) new technology of the 1930s was the radio. “It is the miracle of radio that it welds 60,000,000 Germans into a single crowd, to be played upon by a single voice,” [The Times reported in 1936](#). This was by design. Among Goebbels’s first efforts after the Nazis came to power was to produce and distribute a cheap radio — the Volksempfänger, or people’s receiver — that could bring the Führer’s voice and message into every home. The radio made possible an unmediated, seemingly personal relationship between leader and subject. It cut out the information brokers — reporters, editors, spokesmen, pundits and so on — on whom previous generations of leaders had been forced to rely.



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This 80th anniversary of World War II is an opportunity to reconsider how the world reached that dark defile, in which some 70 million people died. An opportunity, too, to remember the [words of the American judge Learned Hand](#), on how free and civilized people can come back from the brink. “The spirit of liberty,” he said, “is the spirit which is not too sure that it is right.”

**INTRODUCTION:** Krakow to Warsaw is 180 miles at  $15^\circ$  east of north (call vector A). Warsaw to Lublin is 100 miles at  $45^\circ$  east of south (call vector B)

**QUESTIONS:** Show all sketches and calculation procedures in your solution completion. Find resultant displacement (magnitude and direction) from Krakow to Lublin ?

**ANSWERS:**  $R = \sim 156.2$  miles at  $41.32^\circ$  North of East

**EXTRA CREDIT:** For those who work with unit vectors  $i, j, k$ . e.g.: Engineering Physics students.

**QUESTION, (cs):** (a) Find  $x$  &  $y$  components of vector A and write vector A using unit vectors  $i$  &  $j$ ?, (b) Same question as (a) but for vector B?, (c) Find vector resultant  $R = A + B$  using vector notation?, (d) Find magnitude and direction of R?

**ANSWERS:** (a),(b),(c),(d)  $A = 46.59 i + 173.86 j$  ,  $B = 70.71 i - 70.71 j$  ,  $R = \sim 156.2$  miles at  $41.32^\circ$  North of East.