Non-Perpendicular Vectors

Find the resultant vector of adding V1 = 250 m/s at 30° and V2 = 150 m/s at 60°. Find the displacement of this object after 45 seconds?

Step 1: Draw a diagram of the vectors in a head to tail fashion:

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Step 2: Find the x and y components of each vector and sketch them on your figure.

Step 3: Add all the x components together to get **ONE** X vector and all the y components together to get **ONE** y vector.

|  |  |  |
| --- | --- | --- |
| Vector | X component | Y component |
| V1 = 250 m/s @ 30° |  |  |
| V2 = 150 m/s @ 60° |  |  |
| Net Vectors to plot |  |  |

Step 4: To find the resultant vector, Vr = plot the vectors above on a new origin and resolve them for magnitude (hypotenuse) and direction (from positive x axis)

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Vr = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ @ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Find resultant vectors for the following using the same process as above.

|  |  |  |
| --- | --- | --- |
| Prob  | Vector 1 | Vector 2 |
| 1 | 75 m @ 120 ° | 100 m @ 150° |
| 2 | 200 mi/h @ 30° | 75 mi/h @ 110° |
| 3 | 350 km/h @ 220° | 500 km/h @ 110° |
| 4 | 2800 m @ – 40° | 4500 m @ 60° |
| 5 | 150 m/s @ – 75° | 250 m/s 135° |

|  |  |  |
| --- | --- | --- |
| Prob | Vector 1 | Vector 2 |
| 6 | 75 m @ 110 ° | 100 m @ – 60 ° |
| 7 | 200 mi/h @ 30° | 75 mi/h @ 135° |
| 8 | 350 km/h @ 210° | 500 km/h @ 70° |
| 9 | 2800 m @ – 25° | 4500 m @ 50° |
| 10 | 350 m/s @ 180° | 250 m/s 135° |