Check Your Understanding

Consider the diagram below. Nine unique, labeled locations are provided on a grid. Each square on the grid represents a 20-meter x 20-meter area. Rightward on the grid is in the eastward direction and upward on the grid in the northward direction. Use the grid in answering the next few questions.

3. Use the grid to make measurements for a walk from location I to location B to location G to location H. Make the measurements off the grid and use the Pythagorean theorem and SOH CAH TOA to determine the magnitude and the direction of the resulting displacement.

<table>
<thead>
<tr>
<th>Vector</th>
<th>East-West Component</th>
<th>North-South Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>I to B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B to G</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G to H</td>
<td></td>
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</tr>
</tbody>
</table>

Resultant
I to H

Magnitude of Resultant: _________________________
Direction of Resultant: _________________________
4. During her recent trip to the grocery store, Claire de Iles walked 28 m to the end of an aisle. She then made a right hand turn and walked 12 m down the end aisle. Finally, she made another right hand turn and walked 12 m in the opposite direction as her original direction. Determine the magnitude of Claire's resultant displacement. (The actual direction - east, west, north, south are not the focus.)

5. In the final game of last year's regular season, South was playing New Greer Academy for the Conference Championship. In the last play of the game, star quarterback Avery took a snap from scrimmage and scooted backwards (northwards) 8.0 yards. He then ran sideways (westward) *out of the pocket* for 12.0 yards before finally throwing a 34.0 yard pass directly downfield (southward) to Kendall for the game-winning touchdown. Determine the magnitude and direction of the ball's displacement.

6. Mia Ander exits the front door of her home and walks along the path shown in the diagram at the right (not to scale). The walk consists of four legs with the following magnitudes:

   A = 46 m
   B = 142 m
   C = 78 m
   D = 89 m

   Determine the magnitude and direction of Mia's resultant displacement. Consider using a table to organize your calculations.