

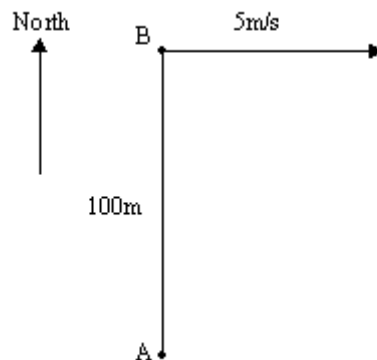
INVESTIGATION #12

Bearing Changes

This investigation looks at the change in bearing of a moving object.



In the diagram here B is directly North of A and 100m away.



Task 1: If B moves in an Easterly direction at a speed of 5 metres per second, answer the following questions;

- What will be the bearing of B from A after 1 second?
- What about after 2s, 3s, 4s, 5s ...?
- What about after t seconds?

Task 2: Draw a graph of time against bearing to better understand the relationship. (You may use your calculator here.) Investigate this relationship.

Task 3: Investigate what happens when the distance from A to B is varied.

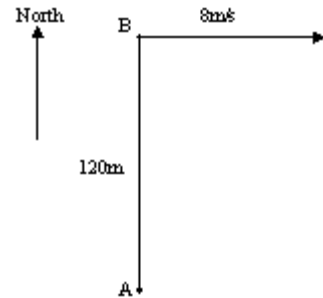
Task 4: Investigate what happens when the speed of B is varied.

Task 5: Try to completely generalise the problem so that you can give the direction for any time, distance or speed.

ASSESSMENT TASK:

Bearing Changes

In the diagram here B is directly North of A and is 120m away from A.



1. If B moves in an easterly direction at a speed of 8 metres per second;
 - (a) What will be the bearing of B from A after 1 second?
 - (b) What will be the bearing of B from A after 5 seconds?
 - (c) What will be the bearing of B from A after t seconds?
2. Sketch a graph of the relationship between the bearing and the time elapsed.
3. Explain what happens to this graph as the time increases.
4. If B starts off at 8 metres per second but only 80m north of A what will be the bearing of B from A after t seconds?
5. If B is 80m north of A and moves off in a westerly direction at 8 metres per second what will be the **bearing** of B from A after t seconds?
6. Write a function that will give the bearing θ of B from A if B starts off d metres north of A and moves east at s metres per second for t seconds.
7. If B moves off on a bearing of 100° in the original problem;
 - (a) What will be the bearing of B from A after 1 second?
 - (b) What will be the bearing of B from A after 5 seconds?
 - (c) What will be the bearing of B from A after t seconds?