Bearings (8–9)

Contents

1 Finding a bearing

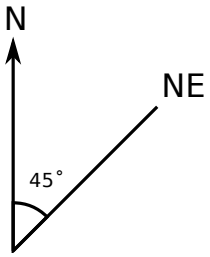
Consider a ship travelling across the ocean: it wouldn't be accurate enough to direct the ship west, or even north east, say. A bearing is a more accurate direction chosen from the 360° of the compass.

How is a bearing found?

To find a bearing, follow these 3 key points:

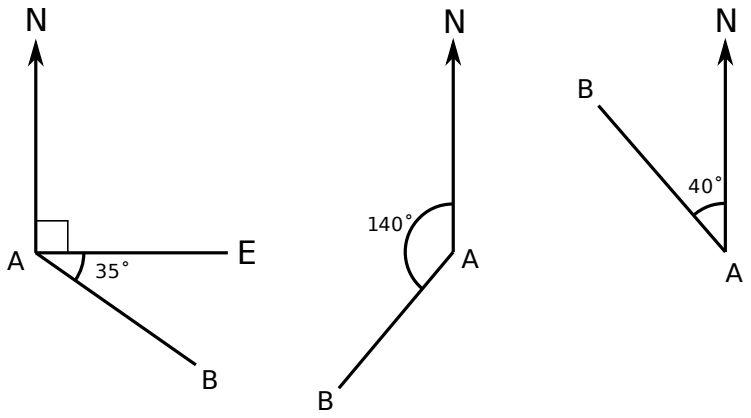
- Start by facing **north**
- Turn **clockwise**
- Give the angle that has been turned through as a **three digit** number

Example. What is the bearing of north east?



If we face north, we have to turn 450 clockwise in order to face North East. Hence, the bearing of NE is 0450 (the leading zero ensures that we have given a three digit number).

Example. In each diagram below, write down the bearing of B from A
(Make sure that you understand the wording of the question: since it is from A, then we want to start at A and work out the direction/bearing to B).

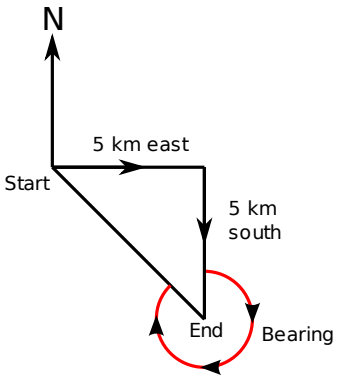


First diagram: turning clockwise from North, we turn through $90°$ and a further $35°$, giving a total bearing of $125°$

Second diagram: turning anticlockwise from North, we turn through $140°$. Since a full circle is $360°$, we need to turn $360 - 140$ which is $220°$

Third diagram: Similar to diagram 2, we turn through $360 - 40$ which is $320°$

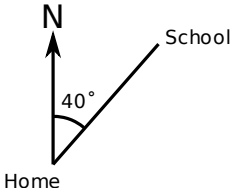
Applied example. A girl walks 5 km East then 5 km South, then returns directly to her starting point. On what bearing should she make her return journey?
Drawing a diagram is really helpful for this type of question:



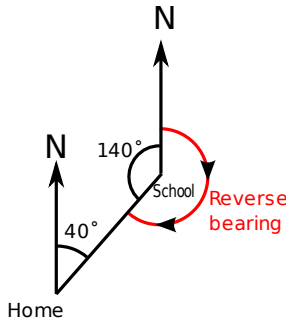
The required bearing is indicated in red (at our end point, we have faced north and turned clockwise in order to face our starting point).
Consider the triangle — it must be isosceles since two sides are equal. Hence, it must have angles of $90°$, $45°$ and $45°$. Hence, our required angle is $360 - 45 = 315°$

2 Reverse bearings

If we know the bearing that we followed on a particular journey (e.g. home to school), what will be our bearing on the return journey (i.e. school to home)? Consider this diagram which shows the journey from home to school on a bearing of $040°$:

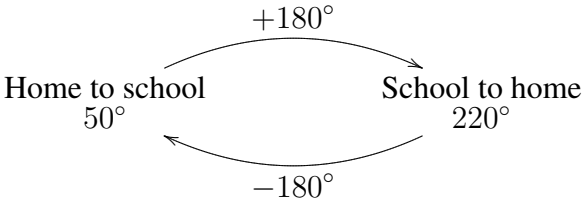


Adding in some extra lines on this diagram, we can use the rules of angles associated with parallel lines (F, Z & C angles) to find the bearing from school to home:
The angle shown in green is $140°$ since $40°$ and $140°$ form a C angle i.e. they are interior angles.
The required bearing is shown in red so is



$$360 - 140 = 220°.$$

Notice that:



A reverse bearing is found by either adding or taking $180°$. This is obvious since you arrive at your destination and need to do a half turn to turn around and go back again.

Example.

- What is the reverse bearing to $50°$?

$$50 + 180 = 230°$$

- What is the reverse bearing to $310°$?

$$310 - 180 = 130°$$