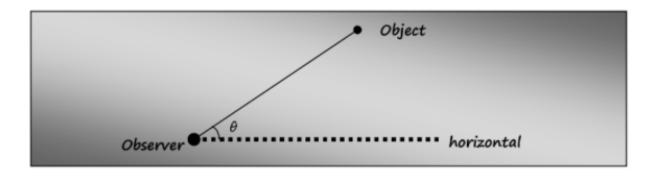


## Angles of elevation and depression

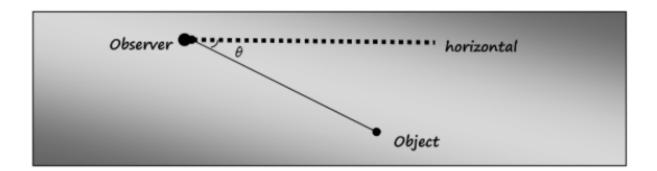
## **Angle of elevation**

An object is above the horizontal level of an observer.



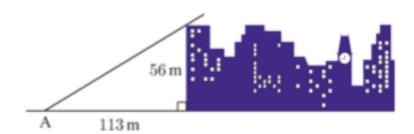
# Angle of depression

An object is below the level of an observer.





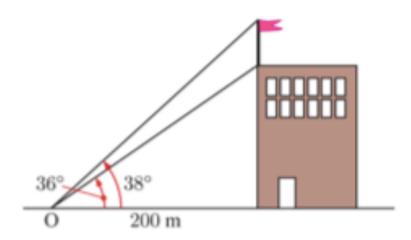
1.



- (a) Find the angle of elevation to the top of a 56 m high building from point A which is 113 m from its base.
- (b) What is the angle of depression from the top of the building A?



2.

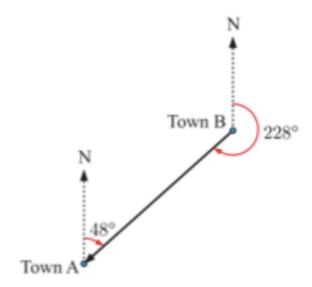


From an observer O who is 200 m from a building, the angles of elevation to the bottom and the top of a flagpole are 36° and 38° respectively. Find the height of the flagpole.



# **True bearing**

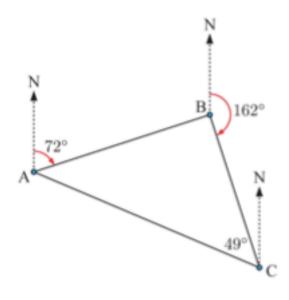
- 1. Clockwise from the true north
- 2. Always 3 digits



The bearing of B from A is 048°. The bearing of A from B is 228°.



1.



In the above diagram, find the bearing of:

- (a) B from A
- (b) B from C
- (c) A from B
- (d) A from C

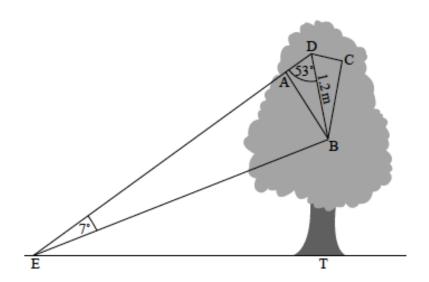


- 2. When Kenneth cycles in the hills, he finishes 30 km west and 24 km south of where he started.
- (a) Find Kenneth's distance from his starting point. (b) In which direction is the starting point from where Kenneth is now?



### **Exercise**

1. Emily's kite ABCD is hanging in a tree. The plane ABCDE is vertical. Emily stands at point E at some distance from the tree, such that EAD is a straight line and angle BED =  $7^{\circ}$ . Emily knows BD = 1.2 metres and angle BDA =  $53^{\circ}$ , as shown in the diagram.



(a) Find the length of EB.

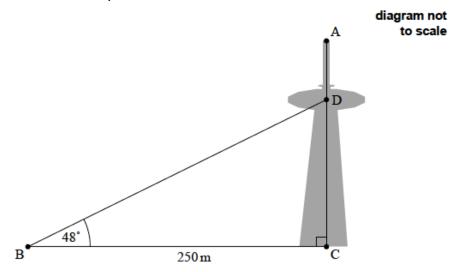
T is a point at the base of the tree. ET is a horizontal line. The angle of elevation of A from E is 41°.

- (b) Write down the angle of elevation of B from E.
- (c) Find the vertical height of B above the ground.

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2. AC is a vertical communications tower with its base at C. The tower has an observation deck, D, three quarters of the way to the top of the tower, A.



From a point B, on horizontal ground 250 m from C, the angle of elevation of D is 48°.

(a) Calculate CD, the height of the observation deck above the ground.

(b) Calculate the angle of depression from A to B.		