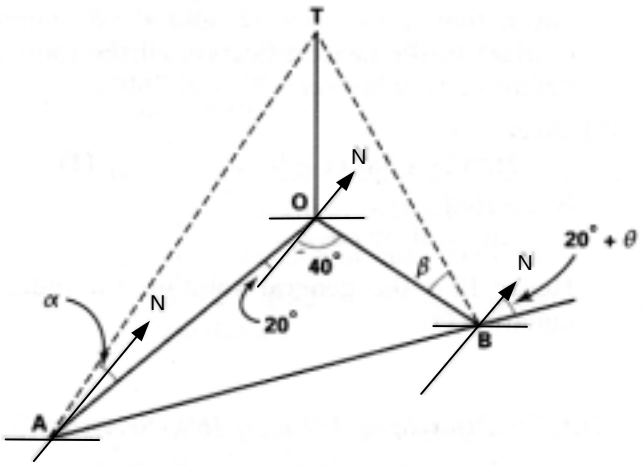
S.4 Add Maths Quiz 8(b)

Time allowed: 30 minutes

Total Mark: 18

1. In the figure, OT represents a vertical tower. AB is a horizontal road. It runs in a direction of N$(20° + \theta)$E. The directions of A and B from O are S20°W and S40°E respectively. A man walks from A to B. He observes that the angle of elevation of T from A and B are α and β respectively.



(a) (i) Find $\angle$OAB in terms of θ.

(ii) By considering ΔOAB, show that

$$\sqrt{3}\cot\theta = 2\tan\beta\cot\alpha - 1.$$

(b) The man finds that at a point C on AB, the angle of elevation, ϕ, of T from him is the largest. Find $\tan\phi$ in terms of α and θ.

(c) Given that $\alpha = 23°$, $\beta = 31°$ and AB = 200 m. Find θ, ϕ and the height of the tower.

(*Give the answers correct to 3 significant figures.*)

(7 + 4 + 7 marks)

End of Quiz