# LATITUDES AND LONGITUDES

# KCSE QUICK REVISION

***Compilation of Possible Questions in Mathematics Likely to be examined in KCSE.***

***A Special Analysis of Prediction Questions that may be Tested in KCSE from this Topic in Form 4.***

# MATHEMATICS

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**SERIES 1**

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***For Marking Schemes***

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# MWALIMU CONSULTANCY

# LATITUDES AND LONGITUDES

**1.** An aeroplane flies from point A ($1^0$ 15'S, $37^0$ E) to a point B directly North of A. the arc AB subtends an angle of $45^0$ at the center of the earth. From B, aeroplanes flies due west two a point C on longitude $23^0$ W.)
(Take the value of $\pi$ $^{22}/_{7}$ as and radius of the earth as 6370km)

(a) (i) Find the latitude of B

(ii) Find the distance traveled by the aeroplane between B and C

(b) The aeroplane left at 1.00 a.m local time. When the aeroplane was leaving B, hat was the local time at C?

**2.** The position of two towns X and Y are given to the nearest degree as X ($45^0$ N, $10^0$W) and Y ($45^0$ N, $70^0$W)

Find

(a) The distance between the two towns in

(i) Kilometers (take the radius of the earth as 6371)

(ii) Nautical miles (take 1 nautical mile to be 1.85 km)

(b) The local time at X when the local time at Y is 2.00 pm.

**3.** A plane leaves an airport A ($38.5^0$N, $37.05^0$W) and flies dues North to a point B on latitude $52^0$N.

(a) Find the distance covered by the plane

(b) The plane then flies due east to a point C, 2400 km from B. Determine the position of C

Take the value $\pi$ of as $^{22}/_{7}$ and radius of the earth as 6370 km

**4.** A plane flying at 200 knots left an airport A ($30^0$S, $31^0$E) and flew due North to an airport B ($30^0$ N, $31^0$E)

(a) Calculate the distance covered by the plane, in nautical miles

(b) After a 15 minutes stop over at B, the plane flew west to an airport C ($30^0$ N, $13^0$E) at the same speed.

Calculate the total time to complete the journey from airport C, though airport B.

**5.** Two towns A and B lie on the same latitude in the northern hemisphere. When its 8 am at A, the time at B is 11.00 am.

a) Given that the longitude of A is $15^0$ E find the longitude of B.

b) A plane leaves A for B and takes $3^1/_2$ hours to arrive at B traveling along a parallel of latitude at 850 km/h. Find:

(i) The radius of the circle of latitude on which towns A and B lie.

(ii) The latitude of the two towns (take radius of the earth to be 6371 km)

**6.** Two places A and B are on the same circle of latitude north of the equator. The longitude of A is $118^0$W and the longitude of B is $133^0$ E. The shorter distance between A and B measured along the circle of latitude is 5422 nautical miles. Find, to the nearest degree, the latitude on which A and B lie

**7.(a)** A plane flies by the short estimate route from P ($10^0$S, $60^0$ W) to Q ($70^0$ N, $120^0$ E) Find the distance flown in km and the time taken if the aver age speed is 800 km/h.

**(b)** Calculate the distance in km between two towns on latitude $50^0$S with long longitudes and $20^0$ W. (take the radius of the earth to be 6370 km)

**8.** Calculate the distance between M ($30^0$N, $36^0$E) and N ($30^0$ N, $144^0$ W) in nautical miles.

(i) Over the North Pole

(ii) Along the parallel of latitude $30^0$ N

**9.(a)** A ship sailed due south along a meridian from $12^0$ N to $10^0$30'S. Taking the earth to be a sphere with a circumference of $4 \times 10^4$ km, calculate in km the distance traveled by the ship.

**(b)** If a ship sails due west from San Francisco ($37^0$ 47'N, $122^0$ 26'W) for distance of 1320 km. Calculate the longitude of its new position (take the radius of the earth to be 6370 km and $\pi = 22/7$).

# *For Marking Schemes/Answers*

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