

AUGUST 2021
EBS 169J
TRIGONOMETRY
1 HOUR 20 MINUTES

Candidate's Index Number:

ABUE/JHS/20/0170

Signature:



UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
SCHOOL OF EDUCATIONAL DEVELOPMENT AND OUTREACH
INSTITUTE OF EDUCATION

COLLEGES OF EDUCATION
FOUR-YEAR BACHELOR OF EDUCATION (B.ED)
FIRST YEAR, END-OF-SECOND SEMESTER EXAMINATION, AUGUST 2021

AUGUST 6, 2021

TRIGONOMETRY

2:40 PM – 4:00 PM

SECTION B

Answer only THREE questions from this section. All questions carry equal marks.

- 1.
- a. A central angle θ subtended by an arc length of 7cm and a radius of 4cm. Find:
- the radian measure
 - the degree measure
 - the area of the sector determined by θ . (8 Marks)
- b. Two towns, $P(30^\circ N, 42^\circ W)$ and $Q(30^\circ N, 18^\circ E)$ are on the surface of the earth. Find, to one decimal place, the distance between P and Q along latitude $30^\circ N$. (Take the radius to be 6400km and $\pi = 3.14$). (12 Marks)
- 2.
- a. Show that the equation is an identity by transforming the left – hand side into the right – hand side.
 $(\sec\theta + \tan\theta)(1 - \sin\theta) = \cos\theta$. (8 Marks)
- b. Show that $3\cos\theta + 4\sin\theta$ may be expressed in the form $R\cos(\theta - \alpha)$, where α is acute. Find the values of:
- R
 - α . (12 Marks)

- 3.
- a. Find the amplitude, the period, and the phase shift and sketch the graph of $y = 2 \cos(3x - \pi)$. (10 Marks)
- b. A helicopter sets out from its base P and flies on a bearing of 123° to point Q where it changes its course to 060° and flies 18km to point R .
- i. Find the size of the angle PQR .
- ii. calculate the bearing on which the helicopter must fly to return directly to its base. When the helicopter is at point R it is 22km from its starting point. (10 Marks)
- 4.
- a. Express $\cos^4 x$ in terms of values of the cosine function with exponent 1. (8 Marks)
- b. When the angle of elevation of the sun is 64° , a telephone pole that is tilted at an angle of 9° directly away from the sun casts a shadow 21 feet long on level ground. Calculate the approximate length of the pole. (12 Marks)