

JULY, 2021
EBS 143
GEOMETRY AND TRIGONOMETRY
1 HOUR, 30 MINUTES

Candidate's Index Number:
Signature:

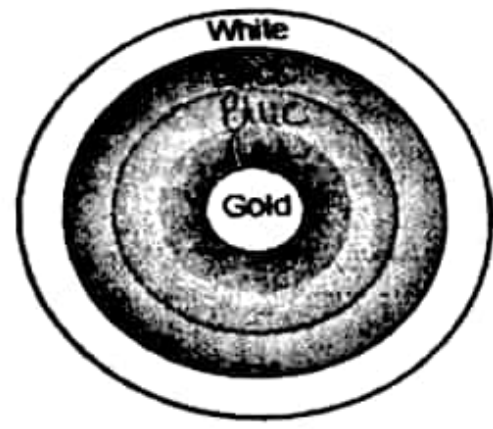
UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
SCHOOL OF EDUCATIONAL DEVELOPMENT AND OUTREACH
INSTITUTE OF EDUCATION

COLLEGES OF EDUCATION
FOUR-YEAR BACHELOR OF EDUCATION (B.ED)
FIRST YEAR, END-OF-SECOND SEMESTER EXAMINATION, JULY/AUGUST, 2021
JULY 26, 2021 GEOMETRY AND TRIGONOMETRY 2:30 PM - 4:00 PM

SECTION B

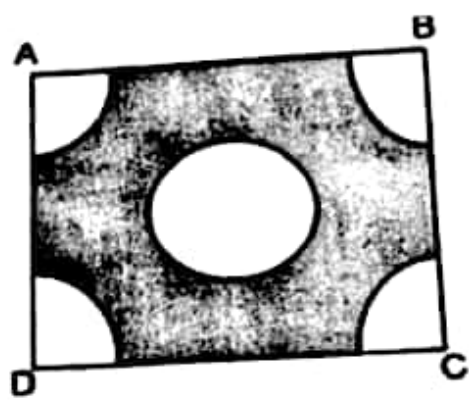
Answer any TWO questions from this section

1. a. The figure depicts an archery target marked with its five scoring regions from the centre outwards as Gold, Red, Blue, Black and White. The diameter of the region representing gold score is 21 cm and each of the other bands is 10.5 cm wide. Find the area of each of the five scoring regions.



- b. Find the perpendicular distance of the point $(-1, 1)$ from the line $12(x+6)=5(y-2)$.

2. a. From each corner of a square of side 4 cm a quadrant of a circle of radius 1 cm is cut and also a circle of diameter 2 cm is cut as shown in figure. Find the area of the remaining portion of the square.



- b. An arc PQ subtends an angle of 120° at the centre of a circle of diameter 14 cm. Calculate
- the length of the major arc
 - the area of the major sector
 - the perimeter of the major sector [Take $\pi = 3.142$]

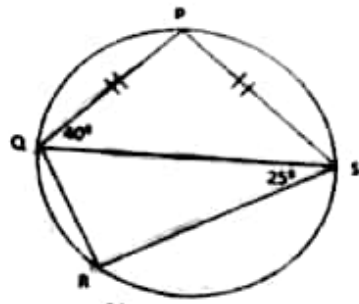
3. a. Town A is 20km from town B and 22km from town C while B is 18km from C. A library is built to help the reading habits of the three towns. It is to be located such that the students from town B and A will always travel equal distance to access the library facility while students from town C will travel exactly 10km to reach the library.
- Using ruler and a pair of compasses only, find by construction, the possible locations for the library; Using a scale of 1cm to 2km.
 - How many of such locations are there?
 - Measure and record the distances of the locations from town B.
 - Which of the locations would be convenient for all three towns and why?

- b. Find the coordinates of the centre and the radius of the circle with equation

$$9x^2 + 9y^2 + 6x - 24y + 8 = 0.$$

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4. a. In the diagram: P, Q, R and S are points on a circle. $|PQ| = |PS|$, $\angle PQS = 40^\circ$ and $\angle QRS = 25^\circ$. Calculate
- $\angle QPS$
 - $\angle QRS$
 - $\angle RQS$



Not drawn to scale

- b. A 5m long ladder leans against a vertical wall at an angle of 70° to the ground. Accidentally the ladder slips down the vertical wall by 2m. Find
- the new angle the ladder makes with the ground
 - the distance to the ground the ladder slipped from its initial position (Correct to 2 significant figures).