

AUGUST 2022
EBS 124/124J
COLLEGE GEOMETRY
1 HOUR 20 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, AUG/SEPT. 2022

AUGUST 22, 2022

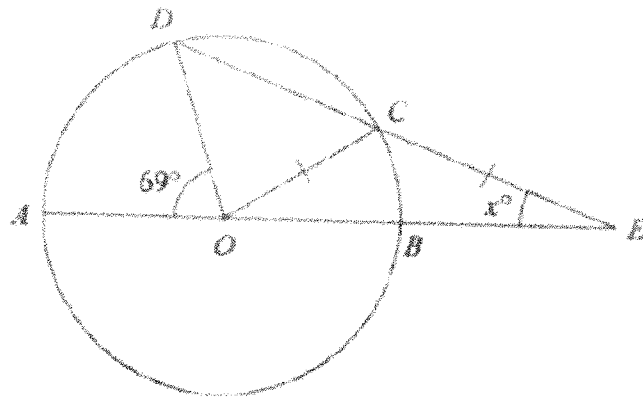
COLLEGE GEOMETRY

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SECTION B
(40 MARKS)

Answer only TWO questions from this section.
Show all workings clearly including well-labelled diagrams where necessary.

1. a. Given that E(0, 1), F(1, 3) and G(3, 0) are the vertices of a triangle. Find the coordinates of the point:
 - i. P that divides FG **externally** in the ratio 2:1; [5 marks]
 - ii. S that divides EF **internally** in the ratio 2:3. [5 marks]
- b. Find, correct to two decimal places, the total surface area of a regular square pyramid that has base length of 50cm and lateral length of 60 cm. [10 marks]
2. a. Find the equation of the tangent to the circle: $x^2 + y^2 - 4x + 6y - 12 = 0$ at the point (5, -7) on the circumference. [10 marks]
From the given equation, the centre of the circle has coordinates (2, -3).
- b. The points, A, B, C and D are points on a circle with the centre, O, as shown in the figure below. Given that AOB and DCE are straight lines, CO = CE and angle AOD = 69° , find the value of x. [10 marks]



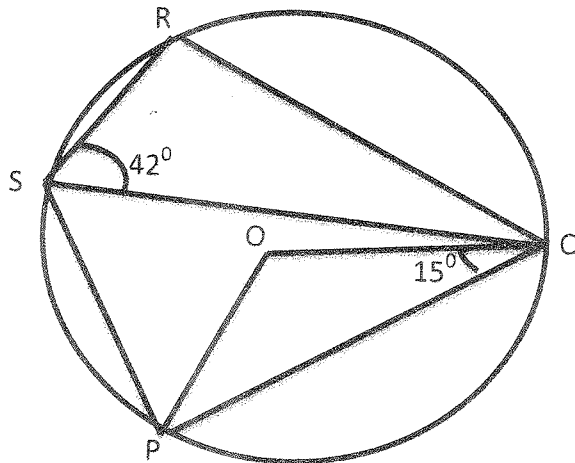
3. a. A sphere of volume 113.112cm^3 has the same base diameter as a cylinder. The cylinder whose height is 15.5cm is then filled with water and the sphere is gently lowered into the cylinder leading to the displacement of some of the water from in the cylinder. Calculate:
- the radius of the cylinder. [6 marks]
 - the quantity of water left in the cylinder. ($\pi = \frac{22}{7}$) [6 marks]

b. In the diagram below, O is the center of the circle, $\angle PQO = 15^\circ$ and $\angle QSR = 42^\circ$.

Calculate:

- $\angle QSP$;
- $\angle RQO$.

[8 marks]



4. Four spots E, F, G, and H are located on a field such that spots E and F are 8 metres apart, spots G and H are 6.5 metres apart and spot E is also 7 metres from H. Straight paths (lines) connecting spots E, F and G are such that $\angle EFG = 60^\circ$ and $\angle FEG = 75^\circ$.

Using ruler and a pair of compasses only:

- locate the positions of the four spots and join them to form a quadrilateral;
- find the distance between spots F and G;
- determine the value of $\angle FGH$;
- locate the point O, such that $|OE| = |OF| = |OG|$;
 - determine $|OE|$.

Use a scale of 1 centimetre to 1 metre.

[20 marks]