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OFFICE OF THE DEPUTY PRINCIPAL
ACADEMICS, RESEARCH AND STUDENTS' AFFAIRS

UNIVERSITY EXAMINATIONS

2018/2019 ACADEMIC YEAR

FOURH YEAR FIRST SEMESTER PART-TIME EXAMINATION

FOR THE DEGREE OF BACHELOR OF EDUCATION (ECPE)

COURSE CODE: **EPE 413**

COURSE TITLE: **MATHEMATICS II**

DATE: 26TH APRIL, 2019 **TIME: 2.00 PM – 5.00 PM**

INSTRUCTION TO CANDIDATES

- **SEE INSIDE**

THIS PAPER CONSISTS OF 5 PRINTED PAGES **PLEASE TURN OVER**

EPE 413E

EPE 413: MATHEMATICS II

STREAM: BED (Primary Education) **DURATION: 3 Hours**

INSTRUCTIONS TO CANDIDATES

i. *Answer Question **ONE** and any other **TWO** questions.*

ii. *Do not write on the question paper.*

Question One

a) If A (2,-7), B(2,-2) and C (7,-2) are the vertices of a triangle, find the image of the triangle under a reflection in the line y=2.5

(3 Marks)

b) A triangle whose vertices are A'(-1.5,-2.5), B'(-1.5,-1.5) and C'(-3.5,-1.5)is an image of the triangle whose vertices are A(1.5,2.5), B(1.5,1.5) and C(3.5,1.5) under a rotation. Find:

i. The Centre and the angle of rotation (6 Marks)

ii. The image of points (0,3), (2,2) and (0,0) (2 Marks)

c) The ratio of the area of two similar rooms is $\frac{4}{25}$.

i. Find the area of the bigger room if the area of the smaller room is $8m^2$. (4 Marks)

ii. Find the ratio of their lengths (2 Marks)

iii. If the length of the larger room is 10m find the length of the smaller one (3Marks)

d) Find the area of the sector of a circle whose radius is 3cm and the angle subtended at the Centre is140^0. (Take $\pi = \frac{22}{7}$) (3 Marks)

e) The two arms of a pair of dividers are spread so that the angle between them is 45°

Find the area of the sector formed if the length of an arm is 8.4cm (Take $\pi = \frac{22}{7}$)

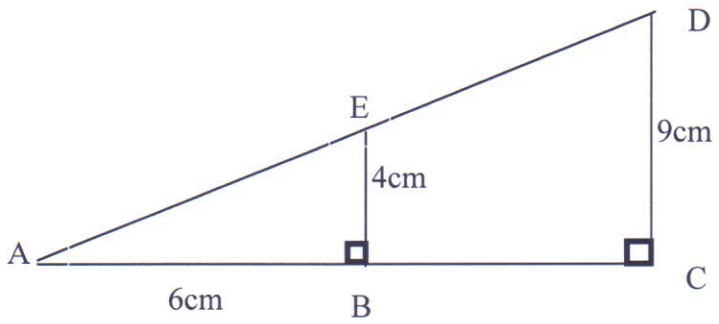
(3 Marks)

f) Show the region that satisfy the following inequalities: (4 Marks)

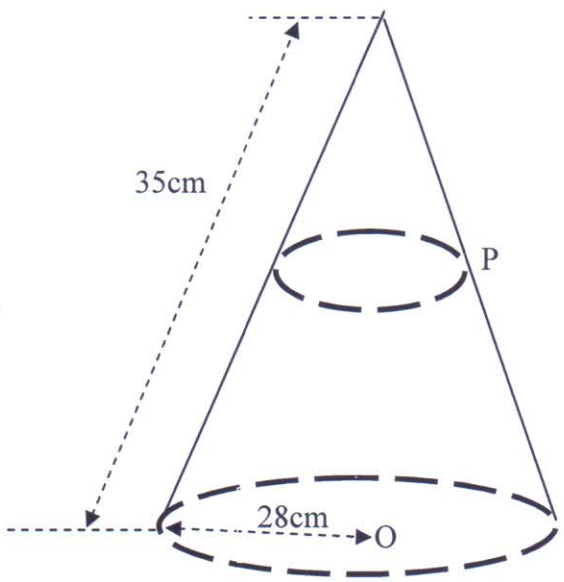
$x \leq 4$
$x > -1$
$y \geq -4$
$y+2 < 5$

Question Two

a) In the figure below, triangle ABE is similar to triangle ACD. Calculate the length of BC (4Marks)



b) calculate length DE (4 Marks)
c) Calculate <EAB (4 Marks)
d) The figure below shows a cone of base radius 28cm and the slant side of length 35cm. At a point P, 14cm vertically below the vertex, the cone is cut a cross to form a smaller cone. Calculate the base radius of the smaller cone. (8 Marks)



Question Three

a) **If a =** $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ **and b =** $\begin{pmatrix} 1 \\ 4 \end{pmatrix}$

Find

i. 3a+ 2b (3 Marks)

ii. 4b -2a (3 Marks)

b) The points A(-4,4), B(-2,3), C(-4,1) and D(-5,3) are vertices of a quadrilateral. If the quadrilateral is given the translation defined by the vector $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$ draw the quadrilateral ABCD and its image under T (8 Marks)

c) Find the coordinates of P if OP = OA + OB – OC and the coordinates of points A,B and C are(3,4), (-4,3) and ((-3,-4) respectively (6 Marks)

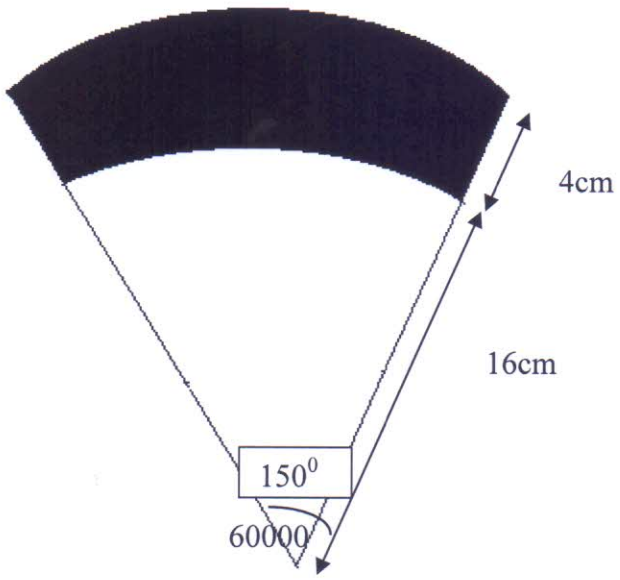
Question Four

a) A right pyramid has a square base of sides 12cm and slant height of 20cm. calculate:

i. Its total surface area (4 Marks

ii. Its volume (2 Marks)

b) The shaded region in the figure below shows the area swept out on a flat windscreen by a wiper. Calculate the area of this region. (8 Marks)



c) The area of a sector of a circle radius 63cm is 4158 cm^2. Calculate the angle subtended at the centre of the circle. (take $\pi = \frac{22}{7}$)

(6 Marks)

Question Five

a) The perimeter of a triangle is 22cm. If one of the sides is 9 cm, find the other sides given that the area of the triangle is 20.976 cm^2.

(5 Marks)

b) Find the area of a rectangle whose length is 12 cm and width 7cm. (4 Marks)

c) A trapezium whose two sides are parallel PS//QR, has PS =15cm, QR = 20 cm, RS = 8 cm and <QRS = 35^0. Calculate the area of the trapezium (5 Marks)

d) Find the length of the size of a regular heptagon of area 168 cm^2 (6 Marks)

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