Sri Jayawardhanapura Educational Zone
G.C.E. (O/L) Examination- 2019
Practice Paper

Subject : Mathematics **Paper I** **Time : 2 Hours**

Part A

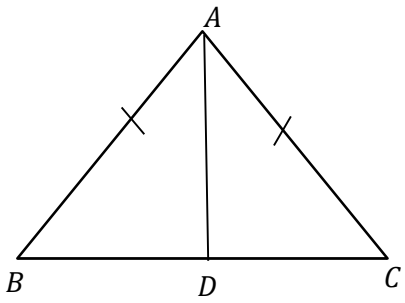
❖ **Answer all questions on this paper itself.**

01. Between which two consecutive whole numbers does the value of $\sqrt{43}$ lie.

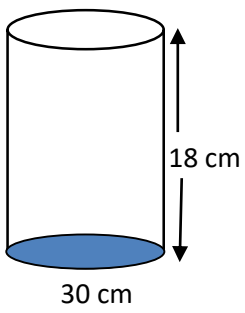
02. Simplify $\frac{2x^2y}{3} \times \frac{9}{4xy}$

03. Write $x^3 = y$ in logarithm form.

04. Write a pair of elements that should be equal to make the two triangles ABD and ADC in the diagram be congruent and Write down the case of congruency.



05. Find the curved surface area of the right cylinder which has the circumference of the base $30cm$ and the height 18 cm.

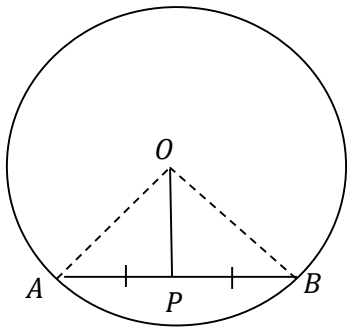


06. Find the least common multiple of $2x, 3xy^2, 4x^2$

07. The percentage of annual rates for a house with the annual assessed value Rs. 80 000, is 15%. What is the rates per quarter for the house.

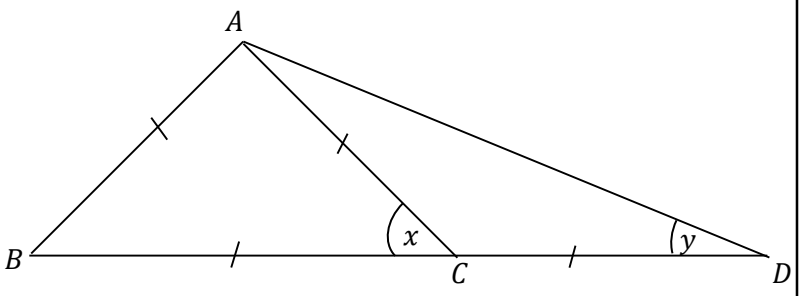
08. If the roots of a quadratic equation of x is -3 and 2. Write down the quadratic equation of x in the form $(x + a)\ (x + b) = 0$. where "a" and "b" are integers.

09. Find the radius of the circle by using the data given in the figure. AB= 16 cm , OP = 6 cm.

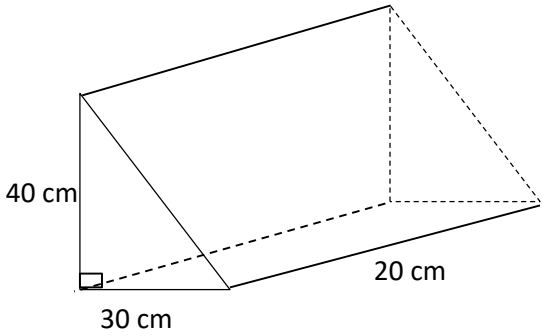


10. Find the gradient and intercept of the straight line which is parallel to the straight line $y = 3x - 2$ and passes through the point $(0, -1)$.

11. Find the value of x *and* y by using the data given in the figure.

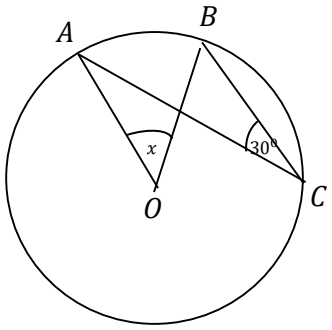


12. Find the volume of the prism, given in the figure.



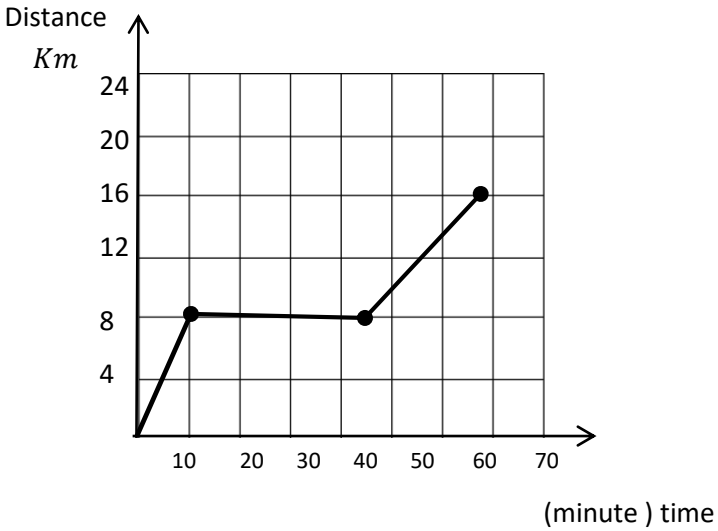
13. Find the value of x by using data given in the figure. The centre of the circle in the diagram is O.

Give reasons for your answer.

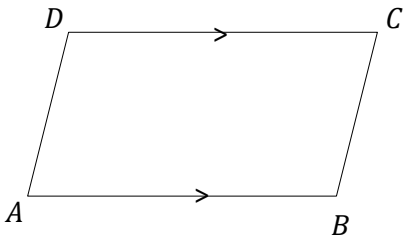


14. 8 men need 3 days to complete a certain work. How many days will it take to complete half of that work by 6 men.

15. The distance-time graph illustrates the motion of a motor vehicle. Find the average speed of the motor vehicle by using the data given in the graph.

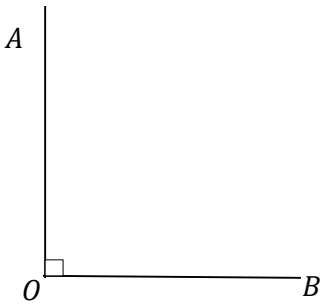


16. Write down a pair elements that should be equal, to make the quadrilateral $ABCD$ in the figure, be a parallelogram



17. Write down the set A= {2,4,6,8} in set builder method.

18. O and B in the figure are two points on a horizontal ground and OA is a vertical pillar. The angle of elevation of A when observed from the point B is 60^0. What is the angle of depression of B when observed from A?



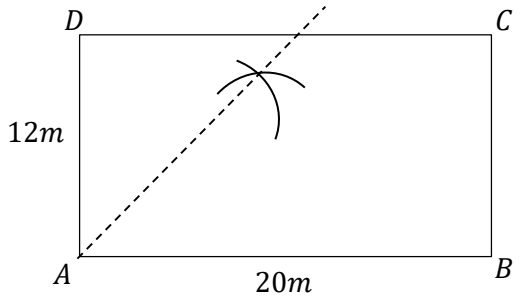
19. Solve $2x - 1 \geq 3$, and represent the solutions on a number line.

20. If A and B are independent events and $P\ (A) = \frac{1}{3}$, $P\ (B) = \frac{1}{2}$, then find $P\ (A \cap B)$

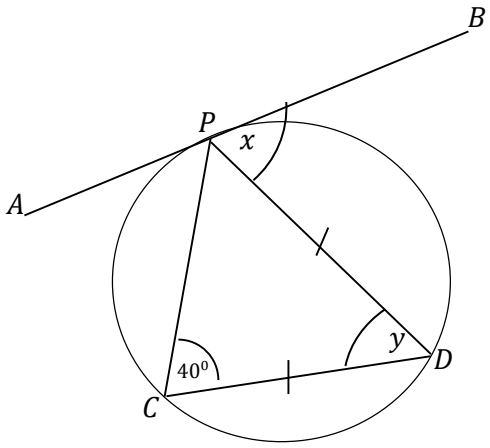
21. Find the interquatile range of the following data.

2, 5, 7, 9, 10, 12, 13, 14, 16, 18, 20

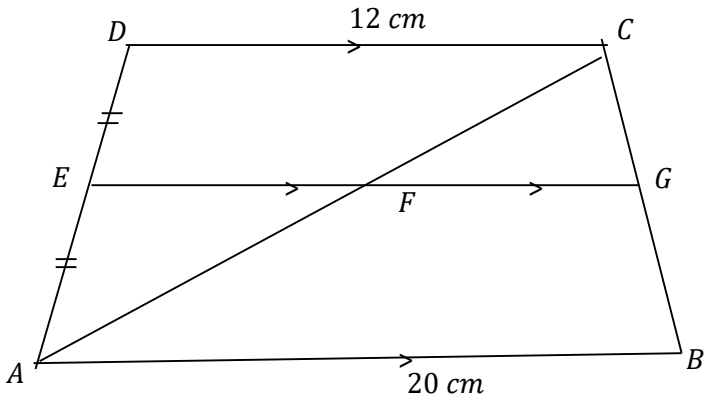
22. AB and AD are two boundaries of a land. A lamp post should be situated equidistant to that two boundaries and 8 m away from A. Using the knowledge of loci, complete the given diagram to obtain the lamp post including construction lines.



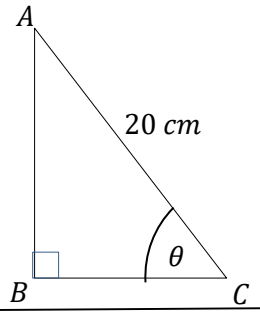
23. Find the value of x and y ,by using the data given in the diagram.AB is a tangent of the circle and it touches the circle at P.



24. Find the length of *EG* by using the data given in the diagram



25. If $Sin\theta = \frac{1}{2}$, Find the value of AB by using the information given in the diagram.



Part B

❖ **Answer all questions on this paper it self.**

01). Of the letters that a post office received on a certain day, $\frac{2}{5}$ were registered letters and $\frac{1}{3}$ were ordinary letters.

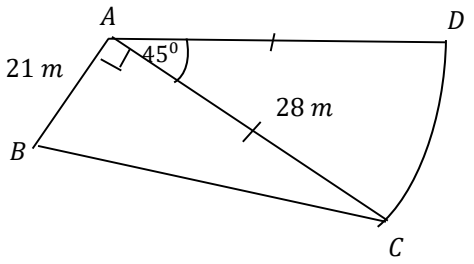
i. Find the number of registered letters and ordinary letters that were received as a fraction of the total number of letters that were received by the post office that day.

ii. $\frac{1}{4}$ of the remaining letters were express letters. Find the number of express letters that were received as a fraction of the total number of letters.

iii. If the remaining letters which were neither registered letters nor ordinary nor express letters were all foreign letters and if this number was 80, then how many registered letters were received that day ?

iv. Find the ratio between ordinary letters and foreign letters.

02). The diagram, shows a model farm prepared for an exhibition. It consists of a right angled triangle plot ABC and a sector shaped plot $ACD(\ Take\ \pi = \frac{22}{7})$



i. What is the length of the arc CD

ii. What is the cost incurred to build a fence around the total plot of land at the rate of Rs. 100 per metre?

iii. Find the area of the plot ACD.

iv. If the organizers expect to allocate a larger area for vegetable cultivation which of the two sections should be selected ? Give reasons.

v. Within this area, a rectangular office of area $35m^2$ has to be constructed so that it is boarded by parts of AB and AC. Length and width of this should be whole numbers in metres. Draw a sketch of the office with dimensions fulfilling the above requirements.

03). a) The annual assessed value of the building in which the business "Samagi" is conducted is Rs. 80 000. The urban council charges Rs 1000 as rates for a quarter, for it.

i. Find the rates that have to be paid for a year , and calculate the annual rates percentage.

ii. A discount of 10% is received if the rates for the whole year is paid before the 31st of January of that year. Find how much the businessman who owns the building can save, if he pays the rates for the whole year before this date.

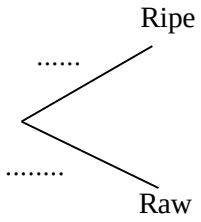
(b) Mr. Perera invested Rs. 240 000 to buy shares of a company which pays Rs. 2 per share as dividends, at a time when the market price of a share of this company was Rs. 12

i. Find the dividends income received by Mr. Perera at the end of a year.

ii. After receiving the dividends, if Mr. Perera sold all the shares at the current market price of Rs. 14 per share, find his capital gain.

04) A mango is taken randomly from bag A which has 5 ripe mangoes and 2 raw mangoes of the same type, shape and size.

taking from bag A

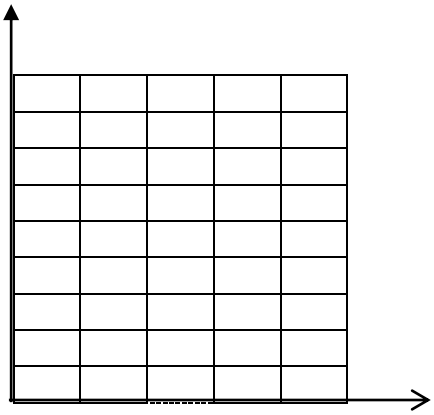


ii. There are exactly 5 ripe mangoes of the same type, shape and size as the above mangoes in bag B. The above randomly taken mango is placed in bag B and then a mango is taken randomly from bag B. Extend the tree diagram to include this information and find the probability of drawing ripe mangoes on both occasions.

iii. Find the probability of taking a raw mango on one occasion and a ripe mango on the other occasion.

b) Two mangoes are taken simultaneously form bag C which contains exactly 3 ripe mangoes and 2 raw mangoes of the above type. Size and shape.

i. Depict the sample space of this experiment on the given grid.



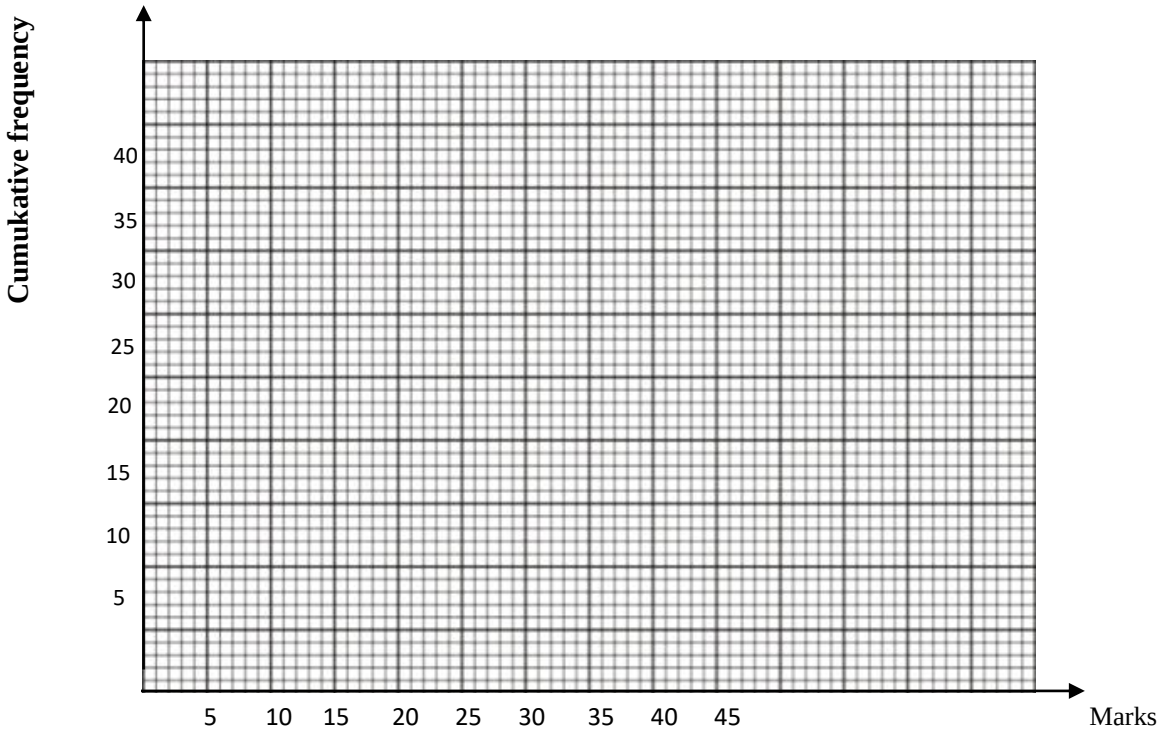
ii. In the grid, encircle the event of taking two ripe mangoes and find its probability

05. Details of the marks made by a group of students at a multiple choice question paper given below. (If x belongs to the class interval $5 - 10$ then $5 \leq x < 10$)

Class interval	frequency	Cumulative frequency
5-10	4	4
10-15	3	7
15-20	5	…
20-25	7	19
25-30	6	25
30-35	3	28
35-40	…….	30

(i) Fill in the blanks of the table.

(ii) Draw the cumulative frequency curve on the following cartesian plane.



iii) By the cumulative frequency graph ,

a) Find the median mark.

b) It is needed to select 25% of the students who got lower marks for remendial teaching. The students below which mark should be selected for this purpose ?

c) To award certificates, if you should select 25% of students who got best marks, the students above which mark should you select ?

Sri Jayawardhanapura Educational Zone
G.C.E. (O/L) Examination- 2019
Practice Paper

Subject : Mathematics **Paper II** **Time : 3 Hours**

- **Answer 10 Questions selecting 5 questions from part A and 5 questions from Part B.**
- **The volume of a cylinder with the radius r and the height h is $\pi r^2 h$.**
- **The volume of a sphere with the radius r is $\frac{4}{3}\pi r^3$**
- **The volume of a cone with radius of the base r and the height h is $\frac{1}{3}\pi r^2 h$.**

Part A

01). The price of a Television at out right purchase is Rs. 36000. It can be purchase by paying $\frac{1}{6}$ of the value initially and paying the rest in 10 equal monthly instalments. The, interest on the loan is calculated on the reducing loan balance. The annual interest rate is 18%. Find the value of a monthly installment.

02). An incomplete table prepared to draw the graph of the function $y = (x + 1)(3 - x)$ is given below.

x	-2	-1	0	1	2	3
y	-5	0	3	4	... .	0

(i). Find the value of y, when $x = 2$

(ii). Draw the graph of the above function using a suitable scale

Using the graph,

(iii). Find the coordinates of the turning point.

(iv). Write down the equation of the graph of this function in the form of $y = a - (x - b)^2$ where "a" and "b" are positive whole numbers.

(v). Find the roots of the equation.$3 + 2x - x^2 = 0$

03). (a) The table given below shows how two persons A and B bought apples and oranges from a certain shop. The price of an apple is Rs 50 and the price of an orange is Rs 40

	Apple	Orange
A	5	3
B	4	2

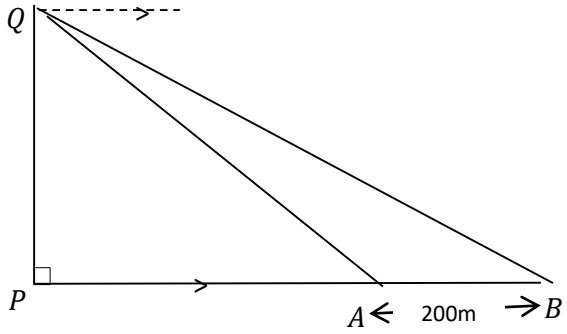
i). Represent the number of fruits both of them bought in a 2 x 2 matrix.

ii). What is the special name used for the above matrix

iii). By multiplying the matrix which represents the number of fruits with the matrix which represent the prices, find the amount of money A and B spent for fruits and represent it in a matrix.

b) Solve the equation. $\frac{2}{x-3} - \frac{3}{x} = \frac{1}{2x}$

04). A light house PQ and two boats A and B which are $200m$ away from each other are situated on the same vertical plane. An observer who is on the top of the light house, observes the two boats A and B with an angle of depression 57^0 and 32^0 respectively.

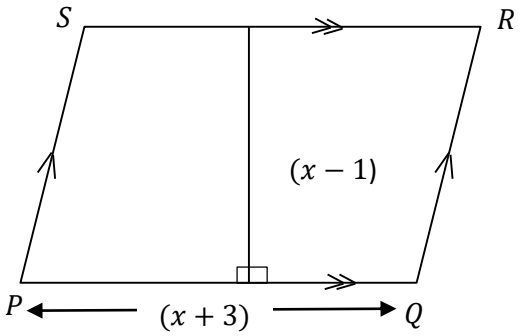


i). Copy the diagram and mark the data given above

ii). Using the scale, 50m represent 1cm, draw a scale diagram and find the height of the light house.

iii). Find the distance between the boat A and the foot of the light house.

05). The area of the parallelogram PQRS given in the figure is 6 square units. By the data given in the figure, prove that, the equation $x^2 + 2x - 9 = 0$ is satisfy by x and if $\sqrt{10} = 3.2$ find the value of x



06). "***A refrigerator is provided to the centers that collect more than 3000 litres of milk during 50 days***."

An officer in charge of the milk collecting centre "kandepola" recorded the following information on the amount of milk that the centre collect daily during the month of November.

i) Write down the modal class of this distribution.

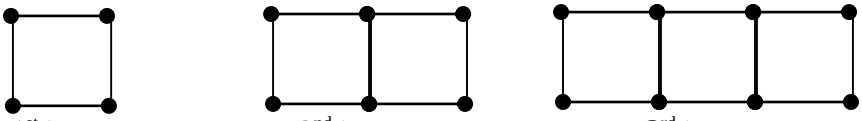
ii) Calculate the mean of the amount of milk that was collected in a day

iii) Using the mean find the amount of milk that is expected to be collected in 50 days. Accordingly will the centre " Kandepola" receive a refrigerator ?

Amount of milk collected per day (litres)	Number of days
20-30	1
30-40	2
40-50	4
50-60	6
60-70	8
70-80	5
80-90	2
90-100	2

Part B

07). The first three instances of a pattern constructed during a mathematical activity of "constructing patterns" by pasting matchsticks are shown in the diagram.



1st instance 2nd instance 3rd instance

i) How many more matchsticks are needed to construct the 2nd instance than the 1st instance of the pattern ?

ii) How many matchsticks are needed to construct the 12th instance of the pattern ?

iii) Amal states that the total number of matchsticks required to construct this pattern up to the 16th instance can be obtained from 8 matchboxes. Assuming that a matchbox contains 50 matchsticks, show that Amal's statement is false.

iv) Show that the total number of matchsticks needed to construct this pattern up to the n^{th} instance is $\frac{n}{2}(5+3n)$

---

8). (a) Two solid metal spheres of radius "r" and a solid metal sphere of radius "2r"" and two solid metal spheres of radius "3r" are made by melting a solid metal sphere of radius "3a" . Assuming that there is no wastage of metal show that $r = \frac{3a}{4}$

(b) Using logarithms table, find the value of $\sqrt{28.32} \times 0.736$, to two decimal places.

---

9). Using only a straight edge with a cm/mm scale and a pair of compasses, and showing the construction lines clearly.

i). Construct the triangle ABC where $BC = 9.0\ cm$, $C\hat{B}A = 60^0$ and $BA = 4.5\ cm$

ii). Construct the circle that touches BC at its mid point L and has its centre on AC. Name the centre as "O"

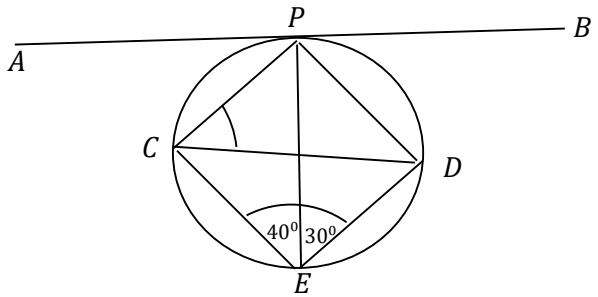
iii). Construct the tangent to the circle from C, which is distinct from CL, and produce it to meet the produced BA at P

iv). What is the special name of that circle with respect to the $\Delta\ PBC$

---

10). a) The diagonals of the quadrilateral $PQRS$ intersect each other perpendicularly at O. Prove that $PQ^2 + RS^2 = PS^2 + QR^2$

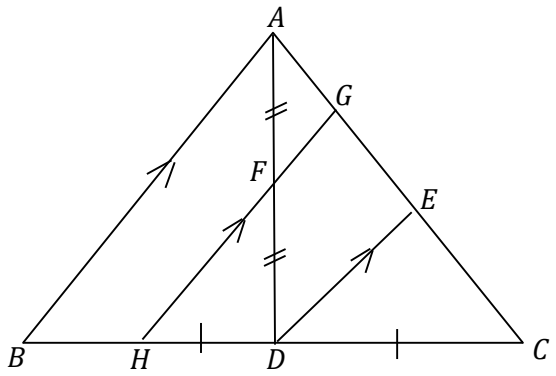
b) The straight line AB touches the circle at P. $D\hat{E}P = 30^0, P\hat{E}C = 40^0$



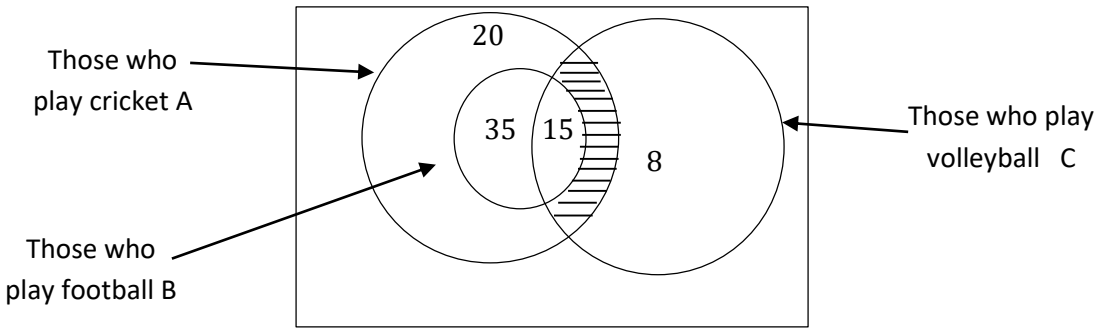
Find the magnitude of the following angles. Give reasons.

i). P$\hat{C}$D ii) D$\hat{P}$B

11). D is the midpoint of the side BC of the triangle ABC in the figure. The mid point of AD is F. The line through F parallel to AB, meets BC at H and meets AC at G. The line through D parallel to AB meets AC at E. Prove that $4\,HG = 3AB$



12). (a) All the students who receive training at a certain sports academy participate in at least one of three sports cricket football and volley ball. The venn diagram provides information on these students.



i). How many students participate in all three sport?

ii). How many students paly only cricket.

iii).Describe the group of students who are represented by the shaded region and express this set using set notation.

iv). If 30 paly volleyball, how many students belong to the shaded region.

v). If a student was selected of randomly from those group , what is the probability that the student paly cricket.

(b) If $\varepsilon =$ {Whole numbers less than10 }

$A =$ {even numbers less than10 }

$B =$ {prime numbers less than10 }

i). Write down the above sets with elements.

ii). Represent the above sets in a venn diagram