



Asian Grammar School
1st Term Assessment – 2018

MATHEMATICS - Grade 11 – PAPER I

Prepared by :Mr. D. Sathsara Premawardane

Name: _____

Class :11 A/ B/ C

2 HOURS

PART A – Answer all the questions. (2 marks × 25 = 50 marks)

1. The value of $\sqrt{39}$ is closest to which of these four?

(i) 6.1

(ii) 6.2

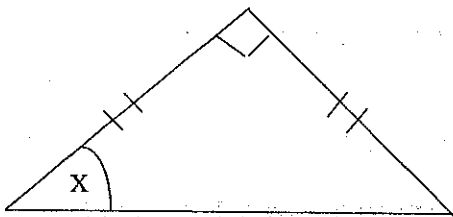
(iii) 6.3

(iv) 6.4

6.1^2	6.2^2	6.3^2	6.4^2
37.21	38.44	39.69	40.96

2. Simplify: $\frac{20x}{21} \times \frac{14}{4x}$

3. Find the value of x based on the information marked in the diagram.



4. A bag contains all identical balls except for the colour. 6 of them are white. Half the number of white balls are the red balls. Number of blue balls is 2 less than the number of white balls. What is the probability of a ball picked up randomly is a red ball?

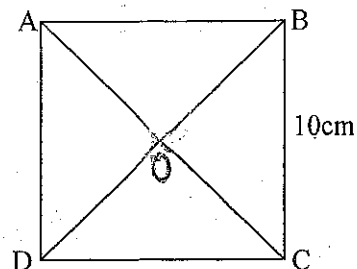
5. Find the Lowest Common Multiple (L.C.M.) of $4x^2y$ and $6xy^2$.

6. $P = \{ x : x \text{ is an prime number, } 10 < x < 20 \}$. Represent the set P by listing its elements.

7. $\log_3 x = 4$. (i) Write this in index form.

(ii) Write the value of x.

8. ABCD is a square. BC = 10cm, find the area of the triangle AOD.



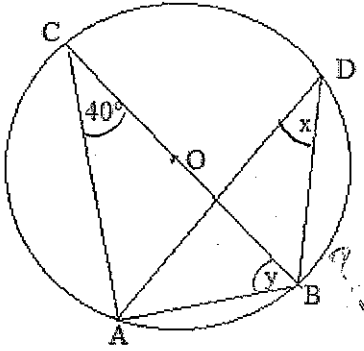
9. Solve $\frac{m}{5} - 2 = 7$

10. To complete a task 6 men take 4 days. If two more men join, how many days will they take to complete the task?

11. Write all the positive integer solutions that satisfy the inequality: $4x + 7 < 23$.

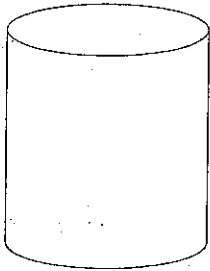
12. Find a and b such that $x^2 + 9x + 20 = (x + a)(x + b)$ for all real values of x.

13. Find the magnitudes of angles x and y . BC is a diameter.



14. Find the area of the curved surface of a cylinder of which; the base radius = 7cm, height = 10cm
(the area of the curved surface of a cylinder = $2\pi rh$; r = base radius, h = height; $\pi = \frac{22}{7}$)

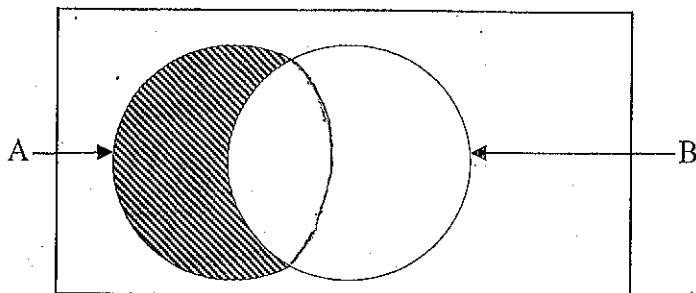
15. The area of the circular cross section of a cylinder is 3m^2 . It's height is 4m. Find the capacity of the cylinder in terms of litres.



16. Mark the correct statement with a tick.

(i) Congruent triangles are equal in area	
(ii) Diagonals bisect the area of a parallelogram	
(iii) Two triangles having equal area are congruent	

17. Represent the set shaded in the diagram in set notation.



18. Express $\sqrt{45}$ in the form $a\sqrt{b}$ where a and b are integers.

19. The annual assessed value of a property is Rs. 8,000.000. The local government authority charges 4% rates per year.

(i) Find the annual tax charge.

(ii) Find the tax charge per quarter.

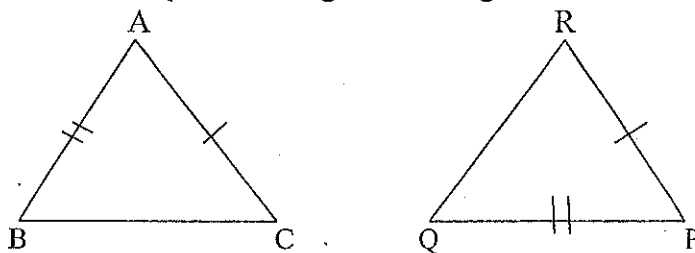
20. State two similarities between a square and a rhombus.

21. Express the speed 30 ms^{-1} in kmh^{-1} .

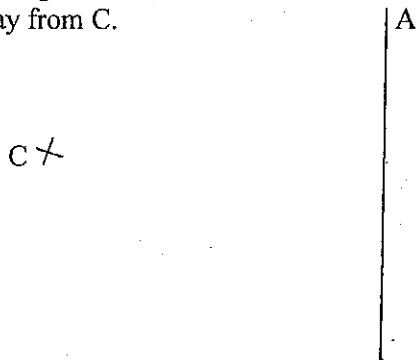
22. Simplify: $\frac{4x}{5} - \frac{8x}{15}$

23. Write the equation of a straight line which has a gradient of 5 and a y-intercept of -6.

24. Which angle in the triangle PQR should be equal to angle BAC in triangle ABC, for the triangles ABC and PQR to be congruent? It is given that $AB = PQ$, $AC = PR$.



25. Based on your knowledge on loci, sketch and show how to locate the point D, which is equi-distant from A and B, and 3cm away from C.



PART B – Answer all the questions. (10 marks \times 5 = 50 marks)

(1). (a) Simplify: $15 \div \frac{3}{4} \times 1\frac{2}{3}$ (4m)

(b) A person who won a lottery, deposited $\frac{2}{3}$ in a bank. Out of the remainder he gave $\frac{1}{4}$ to his daughter.

(i) What fraction remainder after depositing money in the bank. (1m)

(ii) What fraction did he give his daughter. (2m)

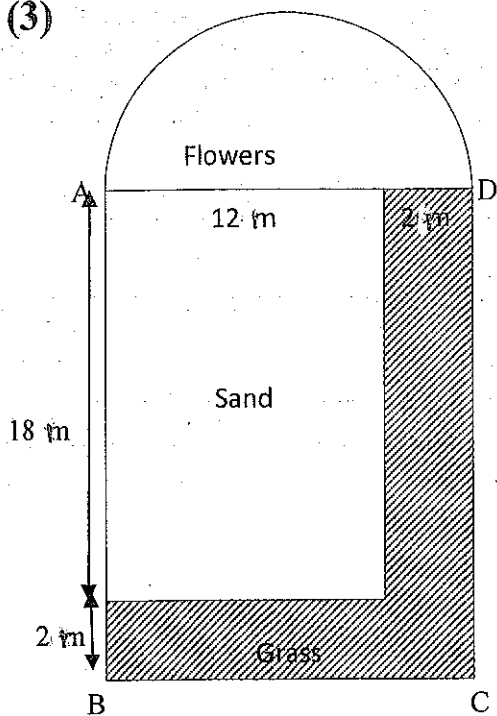
(iii) The sum of money that remained after giving money to daughter, was invested in the business. If he was able to invest Rs. 75,000 , what was the sum of money he won from the lottery? (3m)

(2). (a) Simplify: $\frac{y^2}{6x+18} \div \frac{y}{4x+12}$ (4m)

(b) Simplify : $\sqrt{32} + \sqrt{75} + \sqrt{98} - \sqrt{27}$

(6m)

(3)



The diagram shows how a block of land has been planned out. The grass is grown in the shaded area. Flowers are grown in the semi-circular area. Sand is laid in the remaining part of the land. The width of the area in which grass is grown is 2m

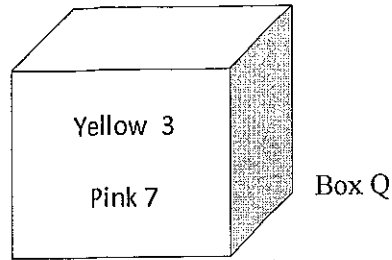
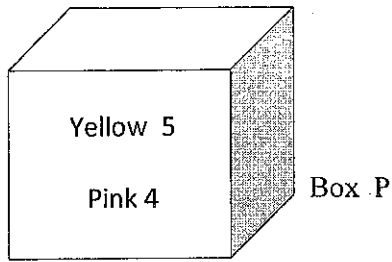
(i) Find the area of the part in which grass is grown. (3m)

(ii) Find the area of the semi-circular part. (2m)

(iii) Find the total perimeter of the entire block of land ? (3m)

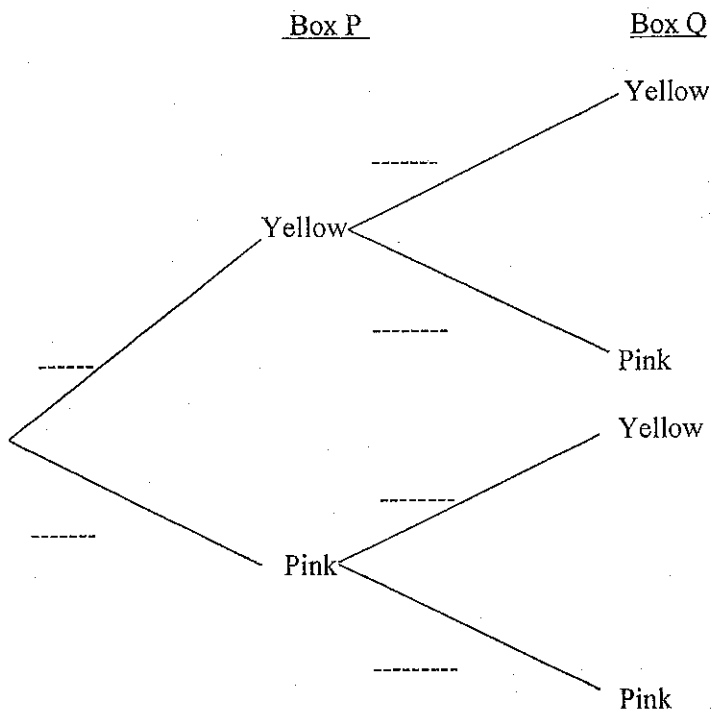
(iv) Instead of the semi-circular part, a rectangular block has to be added to BC (BC as the width), such that the area of the entire land will not change from the original. Mark the alteration on the diagram marking the measurements. (2m)

(4).



This shows the number of identical balls contained in the two boxes P and Q. They differ in colour only.

(i) Complete the tree diagram (including probabilities) to represent drawing of 1 ball each from the boxes P and Q. (4m)

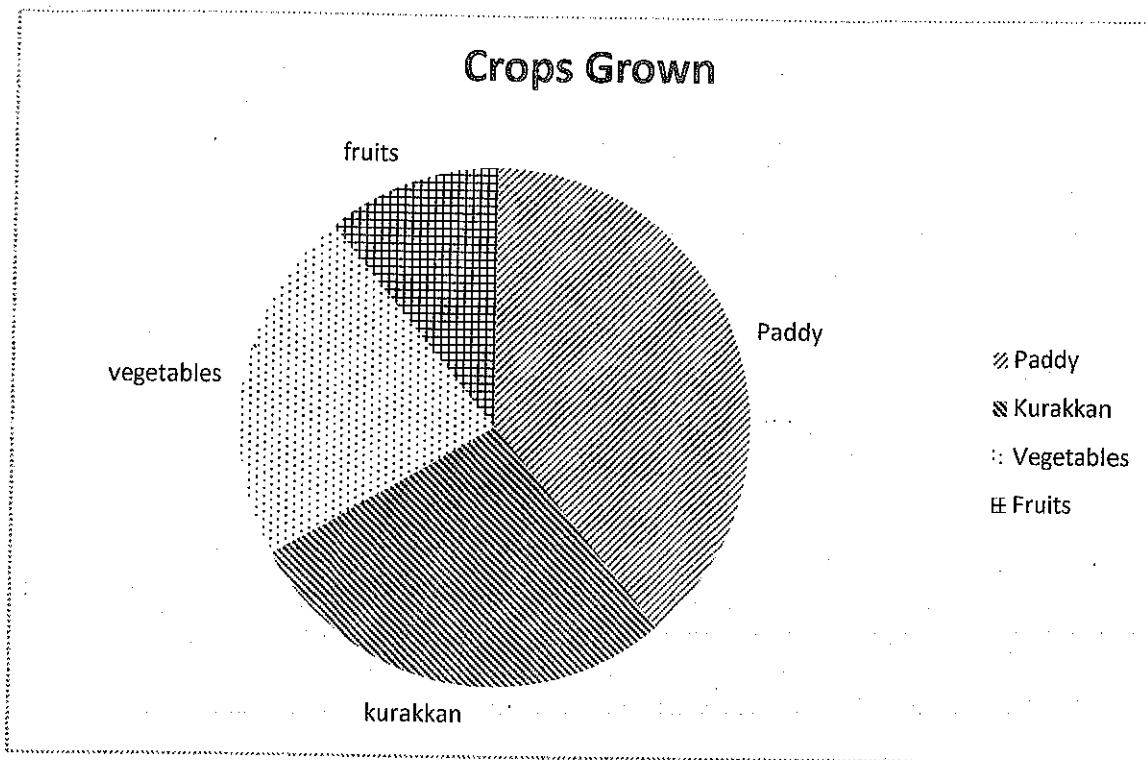


(ii) Find the probability of getting yellow balls from both boxes. (2m)

(iii) Find the probability of getting a pink ball from one box only. (2m)

(iv) Find the probability of getting at least one yellow ball. (2m)

(5). The pie chart shows the distribution of a group of 90 farmers, according to the crops grown.



- (i) What is the angle of the sector which represents 1 farmer? (2m)

- (ii) If the angle of the sector for vegetables is 80° , express the number of farmers growing vegetables as a fraction of the total number of students. (2m)

- (iii) If 35 farmers are growing paddy, what is the angle of the sector representing paddy? (2m)

- (iv) If the angle of the sector representing kurakkan is 100° , find the number of farmers growing kurakkan. (2m)

- (v) Find the angle of the sector representing fruits? (2m)



Asian Grammar School
1st Term Assessment – 2018

MATHEMATICS - Grade 11 – PAPER II

Prepared by : Mr. D. Sathsara Premawardane

Name: _____

Class : 11A / 11B / 11C **3 HOURS**

PART A – Answer 5 questions ONLY. (10 marks × 5 = 50 marks)

The volume of a cone = $\frac{1}{3} \pi r^2 h$; the radius = r , perpendicular height = h

The volume of a cuboid = length × breadth × height

The surface area of a sphere = $4 \pi r^2$; the radius = r

The total surface area of a square based pyramid = $a^2 + 2ah$; a = length of a side of the square base,
 h = perpendicular height of each triangular face

(1) A vehicle is imported for Rs. 5,000,000 for a loan equal to its value to be repaid in one year at 12% annual simple interest rate.

- How much will he pay as interest after one year. (2m)
- A 2% import duty has to be paid. How much is the import duty? (2m)
- The vehicle will be hired for a monthly rental income of Rs. 80,000. What will be the total annual rental income for one year. (2m)
- The annual cost of maintenance is Rs. 100,000. How much will he be left over at the end of one year after repaying the loan completely. (4m)

(2). (a) Given below is the incomplete table to draw the curve $y = x^2 - 6$.

x	-3	-2	-1	0	1	2	3
$y = x^2 - 6$	3	-2	-5	-6	-5		

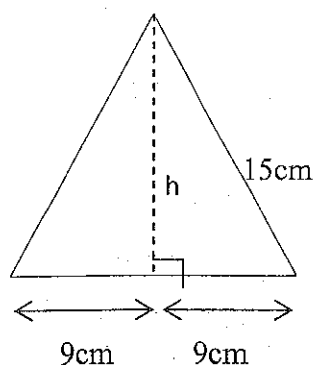
- Fill in the missing values. (2m)
- By using a suitable scale plot the graph $y = x^2 - 6$. (4m)
- Write the axis of symmetry of the graph. (1m)
- Write the co-ordinates of the turning points of the graph. (1m)
- Find the range of values of x , for which the graph increases positively. (2m)

(3). (a) (i) Write the expansion of $(x + y)^2$ (1m)
(ii) By using (i) above or by some other means, write the expansion of $(3x + 7)^2$ (2m)

- By using the relation, $(x + y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$, write the expression for the expansion $(m + 6)^3$ (2m)
- Based on the expression obtained for (b)(i) find the value of 16, by substituting the appropriate number for m . (2m)

(c) Simplify the expression : $\frac{1}{2} \lg 81 + 3 \lg 10 - 2 \lg 3$ (3m)

(4)(a)



The diagram shows one of the 4 triangular faces of a square-based pyramid. The length of a side of the square base = 18cm

(i) Find the value of h. (2m)

(ii) Find the area of the triangular face. (2m)

(iii) Find the area of the square base. (1m)

(iv) Find the total surface area (2m)

(b) Find the radius of a sphere of which the total surface area = 616 cm^2 . (3m)

(5). The table shows the weight distribution of 30 pumpkins brought to a centre for collection of vegetables.

Class interval (Weight in kg)	10-18	19-27	28-36	37-45	46-54
Frequency (No. of pumpkins)	4	9	6	5	6

(i) What is the modal class ? (1m)

(ii) By taking the mid value of the modal class as the assumed mean, or by another method, find the mean weight of a pumpkin? (6m)

(iii) If 200 pumpkins are expected to be collected during a month find the total weight of pumpkins expected to be collected during an year? (2m)

(iv) Express the number of pumpkins heavier than 36 kg as a percentage of all the pumpkins. (1m)

(6).(a) Solve the simultaneous equations : $6a + 5b = 50$; $7a - 2b = 27$ (6m)

(b) Solve the logarithmic equation : $\log_2 x^3 + \log_2 7 = \log_2 4 + \log_2 14$ (4m)

PART B – Answer 5 questions ONLY. (10 marks \times 5 = 50 marks)

(7). A student starts to save his money in a till daily, starting with Rs.15 on the first day and saves Rs.5 more than the previous day.

(i) State the amounts of money that he deposits each day of the first 4 days and state why it conforms to an arithmetic progression. (2m)

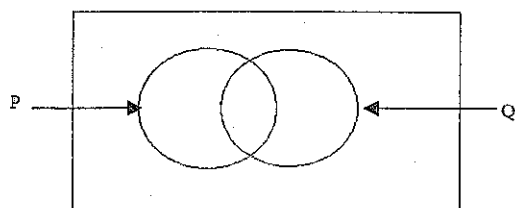
(ii) How many Rupees does he deposit on the 30th day? (2m)

(iii) On which day does he deposit Rs.110 ? (2m)

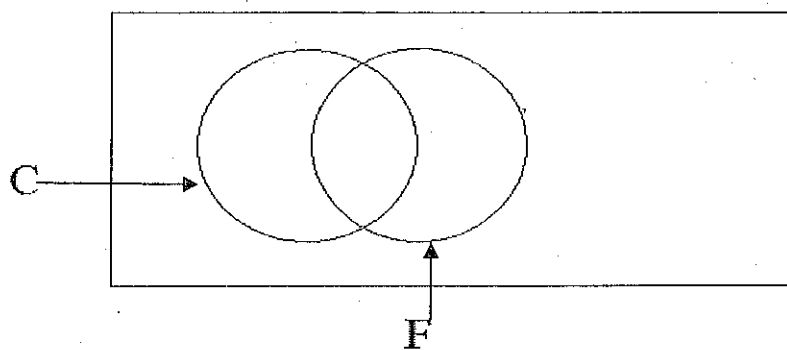
(iv) After 1 month (30 days) , the student wishes to buy 3 t-shirts each priced at Rs 900. State with reasons whether he will be able to buy these with his savings. (4m)

- (8). (i) By using a pair of compasses and a straight edge with a cm/mm scale; construct the triangle ABC such that $AB = 6\text{cm}$, angle $BAC = 90^\circ$ and $AC = 8\text{cm}$. (3m)
- (ii) Construct the perpendicular bisector of AC. (1m)
- (iii) Construct the locus of a point equi-distant from points A and B. (2m)
- (iv) Name the point at which the lines constructed in (ii) and (iii) meet as D. (1m)
- (v) Construct a circle of which the centre is D and the radius is DA. Measure and write the length radius of the circle. (2m)
- (iv) Construct a line through B parallel to AC. (1m)

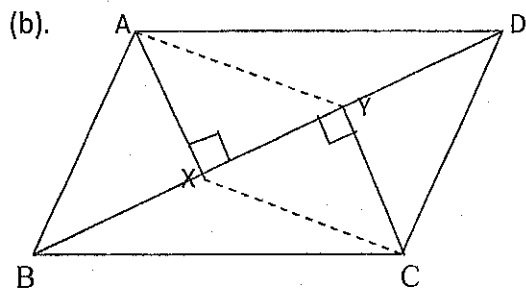
- (9). (a) Mark the region $(P \cup Q)^1$ in a Venn Diagram similar to the one below. (1m)



- (b) If Set $X = \{\text{the farmers who grow vegetables}\}$, write the set notation for the set { the the farmers who do n't grow vegetables } (1m)
- (c) In a sports club there are 100 members. 50 of them play cricket (C) and 30 of them play football (F). There are 15 members who play rugger, but neither cricket nor football.
- (i) Represent the set of members who play Rugger as R on the Venn Diagram. (1m)
- (ii) There are 10 other members who do not play neither of the 3 games mentioned above. Complete the Venn Diagram (state the relevant numbers of members as appropriate) (4m)
- (iii) State the number of members who play both cricket and rugger. (1m)
- (iv) Find the probability that a randomly selected member being one who plays football only (2m)

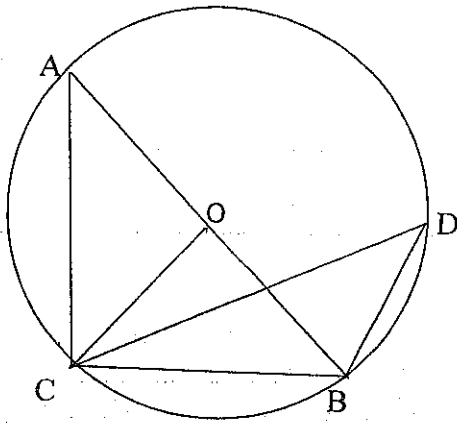


- (10) (a). Write 3 of the conditions under which a quadrilateral becomes a parallelogram. (3m)



- ABCD is a parallelogram. AX and CY are drawn perpendicular to BD. X and Y lie on BD. Prove that ;
- (i) $\triangle ABX \equiv \triangle CYD$ (4m)
- (ii) AXCY is a parallelogram. (3m)

(11).(a)



AB is the diameter of a circle, of which the centre is O. Angle $CAB = 50^\circ$. Find the values of the angles;

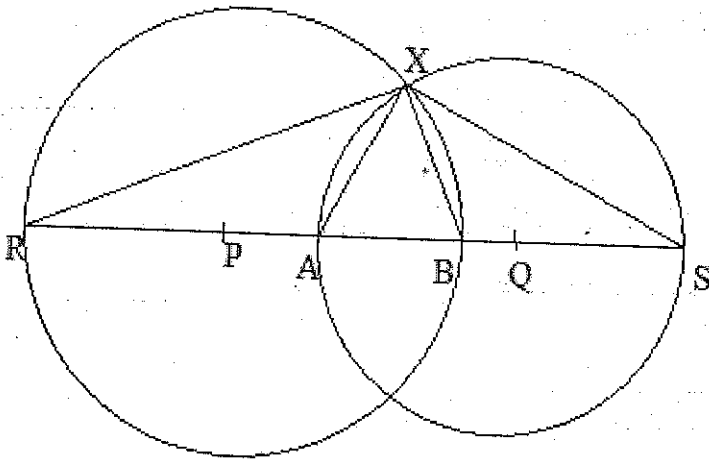
(i) angle CDB (1m)

(ii) angle COB (2m)

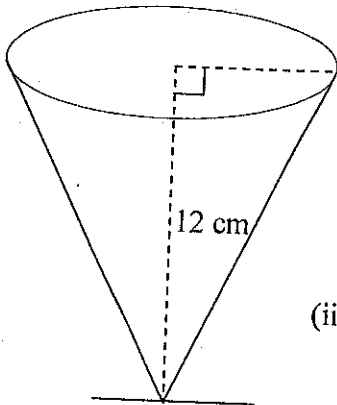
(iii) angle ACB (1m)

(iv) angle OBC (1m)

(b) P and Q are the centres of two intersecting circles having different radii. RS is a straight line which passes through the centres P and Q. A and B are the points where RS cuts the two circles. Prove that angle RXA = angle SXB. (5m)



(12).(a) A right circular cylinder of base radius = r cm, height = 12 cm is made to stand vertically as shown. It is completely filled with water.



(i) Show that the volume of water = $4\pi r^2 \text{ cm}^3$ (2m)

(ii) All of the above water was filled into a vessel in the shape of a square based cuboid to a height of b cm. The length of a side of the square base = a cm. Show that $a^2 = \frac{4\pi r^2}{b}$. (2m)

(iii) By taking $4\pi = 12.56$, $r = 9.57$ cm and $b = 18$, find the value of a^2 (to the nearest whole number) using logarithmic tables. (5m)

(iv) Find the value of a . (1m)