



K/Taxila Central College- Horana

Pilot Test - 2020

Grade 11

Mathematics I

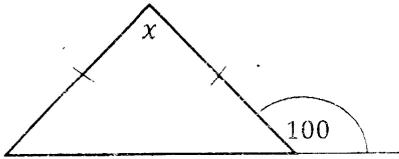
Time 01 hour

Answer the paper itself.

01. If an institute assessed as Rs.60,000 , paid Rs.300 as the assessment tax for a quarter, Find the annual rate of assessment tax (as a percentage)

02. Factorize $16 - 4x^2$

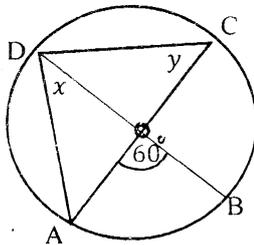
03. Find the value of x



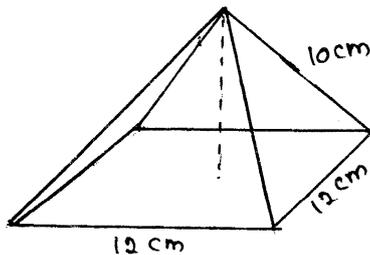
04. Write $\lg 2 = 0.3010$, in index form

05. If the uniform speed of the vehicle is 90kmh^{-1} , find the distance travelled in meters in a minute.

06. A, B, C, D points are on the circle in the 'O' centered circle .Find the Values of X and Y



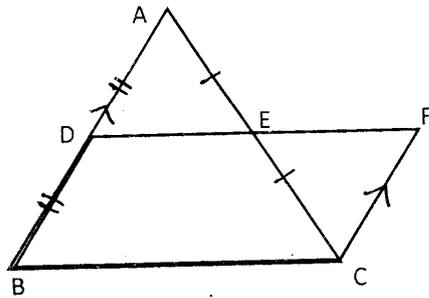
07. In the given square based pyramid,length of 'a'side of the base is 12cm. other edges are 10cm each.Show that the perpendicular height of the pyramid is $2\sqrt{7}$ cm



08. Write the equation of the straight line which passes through the point (0,5)and it's parallel to the graph $y = 2x-5$

09. Simplify $\frac{5}{3x} - \frac{1}{x}$

10.

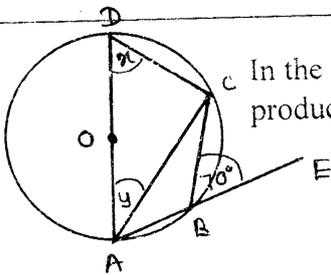


In the $ABC \Delta$ $AB = BC = 10\text{cm}$ and $AC = 8\text{cm}$.
According to given data, find the perimeter of $CEF \Delta$

11. Solve $x^2 - 6x + 9 = 0$

12. A man borrowed Rs.6000 and got released by paying Rs.7800 after 3 years. Find the annual simple rate of interest.

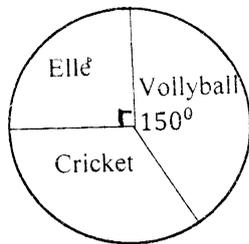
13.



In the O centered circle, A, B, C, D are on the circumference of the circle. AB is produced to E . If $\angle CBE = 70^\circ$ find the value of x and y

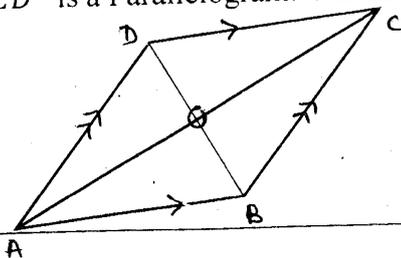
14.

Bellow given pie chart shows the information about 45 students in a class, how they have participated for 3 games. Cricket, Volleyball and Elle. How many students participate for the game cricket?



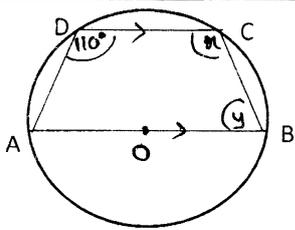
15. $n - 6, n, n + 9, \dots$ are first 3 terms of a geometric progression. Find the value of n .

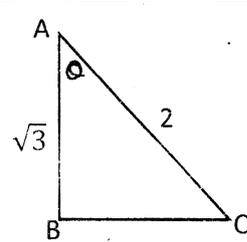
16. $ABCD$ is a Parallelogram. Which statement are correct, according to below statements



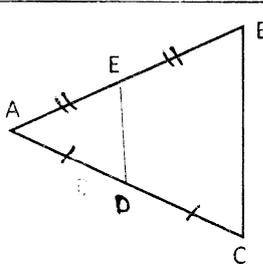
- i. $AO = OD$
- ii. $\text{Area } AOD\Delta = \text{Area } DOC\Delta$
- iii. $OD = OB$
- iv. $AC = BD$

17. Find the L.C.M of $x^2 - y^2$ and $x^2y - xy^2$

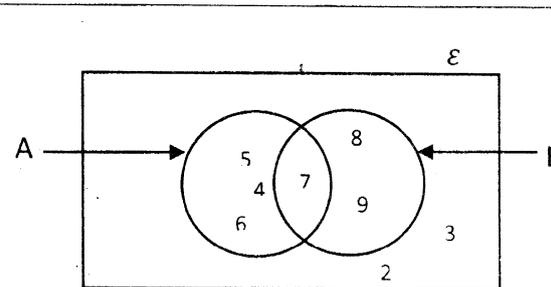
18.  In the diagram $AB \parallel DC$. Find the values of x and y

19.  According to the length of the triangle ABC
 i. Find the length BC side
 ii. Find the value of Q

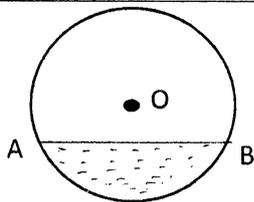
20. A and B are two events . If $P(A) = \frac{12}{25}$, $P(A \cap B) = \frac{5}{25}$ and , $P(A \cup B)' = \frac{5}{25}$
 Find the value of $P(B)$

21.  E and D are the mid points of AB and AC respectively.
 If $BC + ED = 15\text{cm}$, Find the length of BC

22. $\begin{pmatrix} 2 & 1 \\ -3 & 1 \end{pmatrix} \begin{pmatrix} -1 \\ 2 \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix}$ Find the value of x and y .

23.  According to the given diagram , find $n(A \cap B^c)$

24.



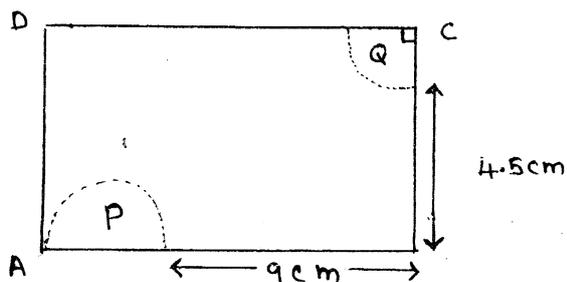
The diagram shows a cross section of a pipe. If the maximum height of the water level is 8cm , find the radius of the pipe ($AB=24\text{cm}$)

25. A and B are two fixed points. Point X, is situated as $\widehat{BAX} = \widehat{ABX}$. Draw the locus of x and explain it using a rough diagram.

Part B

1. Piyal gives $\frac{1}{2}$ of his monthly salary to his daughter, $\frac{1}{2}$ of the remainder to his son, $\frac{1}{2}$ of the remaining part his wife. If the wife receives Rs.45000,
 - i. Find the remaining part as a fraction after giving an amount to the daughter. (2 marks)
 - ii. Which amount is given to the son as a fraction? (2 marks)
 - iii. Find the total salary of Piyal. (2 marks)
 - iv. Which amount is remained from Piyal's monthly salary at the end? (2 marks)

2. The diagram shows a rectangular metal sheet. There, $AB=16\text{cm}$ and $BC=8\text{cm}$.



- i. Find the area of ABCD rectangular sheet. (2 marks)

ii. If P and Q sector parts are removed from the rectangular sheet,
i. Find the perimeter of remaining metal part. (3 marks)

ii. Find the area of that remaining metal part. (3 marks)

iii. Instead of the sector P, a right angled triangular part equal to the area of sector P is removed. There, one side of the right angled triangular sheet is taken as the diameter of the sector P along AD and other side is taken along AB. Draw the relevant right angular triangular sheet part in the above diagram with correct measurements. (2 marks)

3. 6 men take 12 days to build a wall around the school premises

(a) (2 marks)

i. Find the number of men-days for completing the above task. (2 marks)

ii. Because the wall should be built soon, after 8 days another four men were joined to the job. Then how many days before the task gets completed. (3 marks)

(b) A man invested Rs.60,000 when the market price of a share is Rs.30, for buying shares.

i. Find the number of shares he bought? (2 marks)

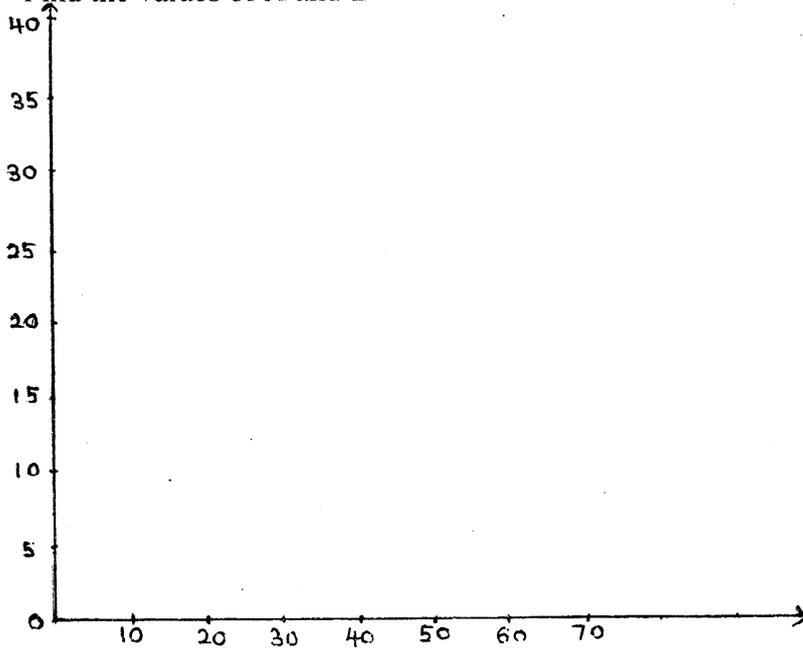
ii. If that company paid Rs.10,000 as the dividends income. find the annual dividends income of a share. (3 marks)

4. Below table shows the information about travelled vehicle in a route with in an hour.

Duration (minutes)	No. of vehicles	Cumulative frequency
0-10	2	2
10-20	5	7
20-30	8	15
30-40	...(A)....	25
40-50	9	...(B).....
50-60	6	40

(i) Find the values of A and B

(2 marks)



ii. Draw the cumulative frequency curve in the given space.

(2 marks)

iii. Using that curve, find the time taken to travel . half of the total number of vehicles.(2 marks)

iv. It says that the number of travelled vehicles with in last 20 minutes exceeds 35%. Is that statement true or false? Give reasons.

(3 marks)

5. In an office, there are two male clerks and three female clerks. On Wednesdays two of them left the office taking half days. Complete the below grid considering the above incident.

male clerk (B)
Female clerk (G)

Second person's leave

First person's leave

Using the above grid,

i. Find the probability that both of them left from the office were male clerks.

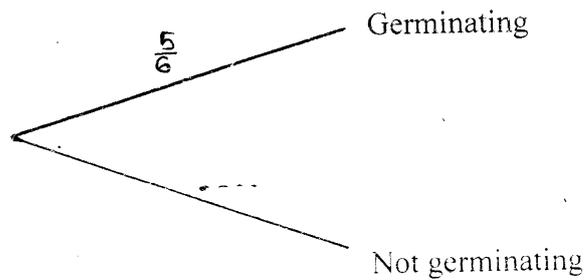
(2 marks)

ii. Find the probability that a female clerk was left first and a male clerk was left second.

(b)

In a packet of vegetable seeds, it says that the probability of germinating seeds is $\frac{5}{6}$. The probability of getting crops (podding) from that plant is $\frac{3}{5}$.

i. The below tree diagram shows the information about how a seed is germinated. Complete it.



(1 marks)

ii. Extend the tree diagram for showing the occasion that getting crops from the first plant. Find the probability of not getting crops though a seed is germinated. (4 marks)

Taxila Central College – Horana

Pilot Test - 2020

Grade 11

Mathematics- II

3 Hours

Answer the questions selecting five questions from part A and five questions from part B.

- ❖ Mention the correct steps and include the units.
- ❖ Each question carries 10 marks.
- ❖ The volume of a right circular cylinder of base radius r and height h is $\pi r^2 h$.
- ❖ The volume of a sphere of radius r is $\frac{4}{3} \pi r^3$.

Part A

- 1) A television set worth Rs.150000 is purchased under calculating the interest on reducing balance system.(hire purchase) paying Rs.30000 as the down payment and the remaining amount to be paid within 24 monthly installments. The value of an installment is Rs.6000.
- I. Find the balance
 - II. Find the total interest
 - III. Find the number of month units.
 - IV. Find the interest per month unit.
 - V. Find the annual rate of interest.

- 2) An incomplete table of values prepared to sketch the graph of $y = -x^2 + 4x - 1$ is given below.

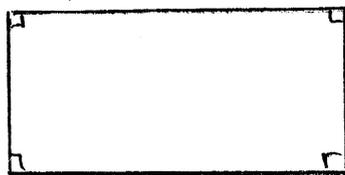
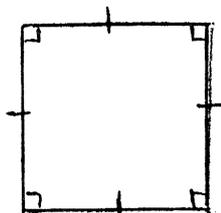
x	-1	0	1	2	3	4	5
y	-6	-1	2	2	-1	-6

- I. Find the value of y , when $x = 2$
- II. Draw the above graph taking 10 small divisions along x – axis and y – axis to be unit as scale.

b. By considering the graph,

- I. Write the range of x , when $y \geq -1$
- II. Write the co-ordinates of the turning point
- III. If the above function can be expressed in the form of $y = k - (x + h)^2$ find the values of k and h .
- IV. Find $\sqrt{3}$ [positive value]

3)



The length of a side of a square is 4cm. The area of the square is equal to the area of the rectangle. The breadth of the rectangle is 4cm less than the length of the rectangle.

- I. If the breadth of the rectangle is x , find its length.
- II. Show that the area of the rectangle satisfies $x^2 + 4x - 16 = 0$
- III. Using completing square or any other method, solve $x^2 + 4x - 16 = 0$. Find the length of the rectangle correct to 1st decimal place. (Take $\sqrt{5} = 2.23$)

04. (a) A person spends Rs.7800 to buy 1kg of beans to the price of Rs.80, and 1kg of carrots to the price of Rs. 60. After he gets a profit of Rs. 5600 by selling 1kg of beans to the price of Rs.140 and 1kg of carrots to the price of Rs.100. Taking the number of bought beans kilograms as x and the number of bought carrot kilograms as y , construct a pair of simultaneous equation's to represent the above information. Find the values of x and y .

(b) When the market value is changed the vender spends Rs. 12000 to buy 60 kilograms of beans to the price of Rs. 85 each and P kilograms of carrots to the price of Rs. 70 each. Find the maximum number of kilograms of carrots can be bought? (P is a positive integer)

05. A solid metal cylinder which its radius of the base is (a) units and the height is $2a$ units, and a solid metal cone which its radius of the base is (a) units and the height is (a) units, are made of same material. After melting above solid metal cylinder and the cone, 16 metal hemispheres of radius $x/2$ each are made without any wastage. Show that $x = \sqrt[3]{7/4} a$.

When $a = 3.5\text{cm}$, find the value of x correct to 2 decimal places using logarithms.

06. In the route of Horana-Colombo, the part of the road from Pokunuwita to Gonapala is rapidly reconstructed in these days. For this major task, 40 tractors are used daily for transporting concrete stones. Below frequency distribution shows the information about the above task conducted by "Mega" company.

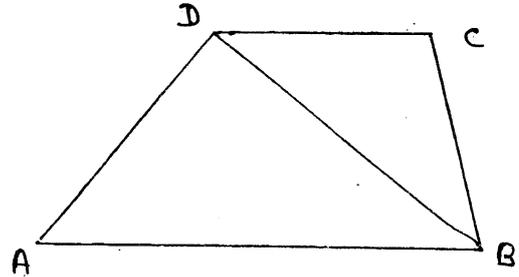
Class Intervals (transporting turns)	3-5	6-8	9-11	12-14	15-17	18-20
Frequency (No. of tractors)	3	4	6	9	13	5

- i. Express the number of tractors, transported less than 9 turns as a percentage of total number of tractors.
- ii. Find the mean number of transporting turns.
- iii. Find the mean transporting turns of concrete stones by a tractor in a day.

In the "O" centered circle $ADC = x$, $AB \parallel CD$ and AD and BC lines intersect at Q .

- I. a) Write $\angle ABC$, $\angle AOC$, $\angle AQC$ using x . (give reasons)
- b) Show that A, O, Q and C points are concyclic.

10) In the below diagram, $ABCD$ is a trapezium, which $AB \parallel DC$ and $AB = 2DC$. The midpoint of BD is O . The extended CO line meets AB at E .



Copy the above diagram to your answer script and include data.

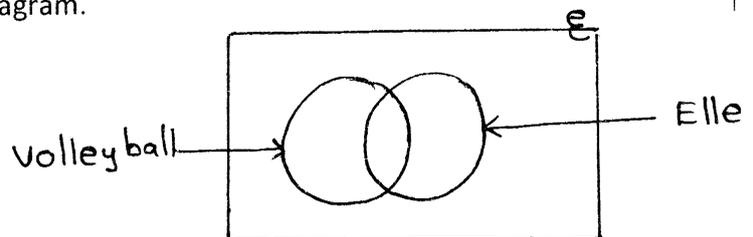
- I. Prove that $\triangle DOC \cong \triangle EOB$
- II. Show that $BCDE$ is a parallelogram
- III. Draw a parallel line to AB through " O ". That parallel line meets CB side at F . Prove that $OF = \frac{1}{4} AB$.

11) On a horizontal ground, a person at point A , observes the top of a building which is in front of him with an angle of elevation of 35° . Next the person walks 25m towards the building to point B . Now he observes the top of the building with an angle of elevation 60° from B . Taking a suitable diagram, find the height of the building correct to the nearest meter using trigonometric ratios.

12) Below given the information about 100 students in grade 11.

- ❖ 55 students like volley ball
- ❖ 25 students like Elle.
- ❖ 30 students don't like both volley ball and Elle.

Include above data in the below given venn diagram.



i. Find the number of students who like both volley ball and Elle.

ii. Find the number of students who don't like to play Elle, but like to play volley ball.

b) 40 boys out of above 100 students, play volley ball, 6 of those boys play Elle.

i. Copy the above venn diagram again to the answer script and include the subset of boys in the venn diagram.

ii. Write the number of elements relevant to each area of the venn diagram.

iii. Find the number of girls who play volleyball.