QUESTIONNAIRE Mathematics Test 6. Population 3b

QUESTION 1 On the outside of two sides of a rectangular plot 25 by 20 metres there is a path of uniform width. The area covered by the path equals one half the area of the plot. What is the width of the path in metres?

QUESTION 2

According to one plan for travelling to Mars, the round trip would take almost exactly three years, including a stay on Mars of 449 earth days. If one must go 34,000,000 miles each way on the trip, which of the following can be used to give an estimate of the average speed of travel in miles per hour?

A.	(3 x 365 - 449) x 24	П	34,000,000 x 24				
	34,000,000	υ.	2 x (3 x 365 - 449)				
в.	(3 x 365 - 449) x 24 34,000,000 x 2						
C.	34,000,000	Ε.	2 x 34,000,000				
	(3 x 365 - 449) x 24		(3 x 365 - 449) x 24				

QUESTION 3

Of three wires, each 36 in. long, one is bent into a square, another into a rectangle with length and width in the ratio of 2 : 1 and the third into an equilateral triangle. Which one of the following statements describes the correct relationship between the enclosed areas ?

- A. The area of the square is the greatest and that of the triangle is the least.
- B. The area of the rectangle is the greatest and that of the triangle is the least.
- C. The area of the triangle is the greatest and that of the square is the least.
- D. The area of the triangle is the greatest and that of the rectangle is the least.
- E. The areas of the square and the rectangle are the same, but the area of the triangle is less than that of the square or the rectangle.

QUE	ESTIO	N 4									
				х							
				-							
	x +	У		2							
If	3	=	81 and	d 25 =	5,	then	y is				
								7			15
	Α.	0	в.	2	С.	3	D.	-]	Ε.	
								2			4

QUESTION 5 A certain number of students are to be accommodated in a hostel. If 2 students share each room, then 2 students will be left without any room. If 3 students share each room, then 2 rooms will be left unoccupied. How many rooms are there in the hostel?

QUESTION 6 Four persons whose names begin with different letters are placed in a row, side by side. What is the probability that they will be placed in alphabetical order from left to right?

A. 1/120 B. 1/24 C. 1/12 D. 1/6 E. 1/4

QUESTION 7

A number is the multiplicative inverse of another number if the product of the two numbers is 1. Which of the following sets of numbers is identical to the set of its multiplicative inverses ?

A.	{1, 2, 3}	D.	{2,	3,	5,	1 -, 2	1 -} 3
в.	$ \{1, -\} \\ 2 $						
C.	$\{1, 2, -\}$	E.	{2,	3,	2 -} 3		

QUESTION 8

In the figure above, the circle with centre C touches, internally, at point T, the circle with centre O. P is a point on the larger circle such that TP is not a diameter. If TP intersects the smaller circle at A, then what additional information is needed to prove that AC and PO are parallel ?

Α.	None	D.	CO = 2TC
в.	PO = 2AC		
C.	TA = AP	Ε.	TA = AC

OUESTION 9 Which of the following is (are) truc for all values of for which the functions arc defined? I. $sin(-\acute{e}) = -sin\acute{e}$ II. $\cos(-\acute{e}) = -\cos\acute{e}$ III. $tan(-\acute{e}) = -tan\acute{e}$ A. I only D. I and III only B. II only C. III only E. II and III only QUESTION 10 A radio-active element decomposes according to the formula -kt у=уе 0 where y is the mass of the element remaining after t days and y is the value of y for t = 0. Find the value of the constant k for an element whose half-life (i.e., time to dccompose half of the material) is 4 days. A. -4 log 2 D. (log 2) е e 4 B. log « E. 2e е C. log e 2 QUESTION 11 A stationer wants to make a card 8cm. long and of such a width that, when

it is cut into halves, the original width becomes the length and the shape of each llalf is similar to the original card. What width, in cm., should he make the original card ?

A. 4 B. 4û2 C. 5û2 D. 5û3 E. 6

QUESTION 12 The arithmetic mean or average of one group of 100 pupils is exactly 80 and the mean of another group of 50 pupils is exactly 65. What is the mean of the combined group of 150 pupils?

A. 79 B. 72.5 C. 75 D. 77.5 E. It is impossible to determine exactly.

QUESTION 13 In the diagram on the right, the numbers represent regions. The circle X represents the set of regular polygons The circle Y represents the set of [Picture] quadrilaterals The circle Z represents the set of equilateral triangles Which are the parts of the schema that are empty [have no elements] ? A. 1, 3 and 5 D. 1, 3 and 7 B. 2, 3 and 4 C. 1, 6 and 7 E. 3, 6 and 7 QUESTION 14 In the figure on the right, FGHJ is a parallelogram. Which of the following statements is a condi-[Picture] tion which implies that FGHJ is a rectangle ? [Note: the character À denotes the character for an angle A. JF = GH B. À HJG = À JGF C. À HJF = A JHGD. À HJF and À JGH are supplementary. E. HF and JG are perpendicular bisectors of each other. QUESTION 15 What is the sum of the infinite geometric series 1 1 1 1 - - + - - - + . . . ? 2 4 8 2 3 3 B. - C. - D. - E. ì 5 A. – 3 5 2 8 QUESTION 16 A goods train travelling at 50 miles per hour leaves a station 3 hours before an express train which travels in the same direction at 90 miles an hour. How many hours will it take the express train to overtake the goods train?

	5		9		12		15		18
Α.	-	в.	-	С.		D.		Ε.	
	9		5		5		4		4

1

QUESTION 17 In the right-angled triangle PQR (on the right) the measure of PQ is 4 and é can be any angle between 30ø and 45ø. What are all possible values for x, the length of RQ?

[Picture]

Α.	0	<	х	<	4
в.	1 - 2	<	x	<	û2 2
C.	1 - 2	<	x	<	û3 2
D.	2	<	x	<	2û2
Ε.	2	<	x	<	2û3