

Surname _____

Name _____

Father's name _____

THE G C SCHOOL OF CAREERS MATHEMATICS SCHOOL



MATHEMATICS APTITUDE TEST 2022-2023

TIME: 1 HOUR 30 MINUTES

- The paper consists of **two parts**.
- The first part consists of **15 multiple choice questions**.
- The second part consists of **15 problems**.
- **Calculators** are **NOT** allowed for this examination.

Good Luck!

This examination paper consists of 17 pages, including this page.

PART A – MULTIPLE CHOICE QUESTIONS

- This part consists of 15 questions.
 - Answer ALL questions in the space provided.
 - There is only one correct answer to each question.
 - Circle the correct answer.
 - Each question is 2 marks
-

1. Find the value of:

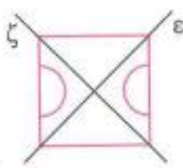
$$\frac{12 \times 1.73 + 12 \times 1.27}{9 \times 0.37 + 9 \times 1.63} =$$

- (a) 1 (b) 2 (c) 3 (d) 4 (e) 5
-

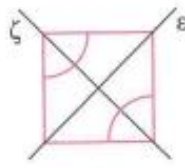
2. The five-digit number 4★ ★ ★ 5 is exactly divisible by 3. The digits hidden under the stars are all the same. Find how many such five-digit numbers there are possible.

- (a) 3 (b) 6 (c) 9 (d) 10 (e) none
-

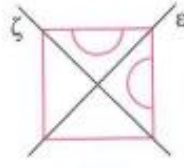
3. Which of the following shapes has a line of symmetry the line ϵ and does not have line of symmetry the line ζ ?



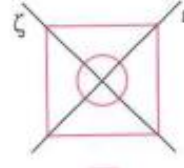
(a)



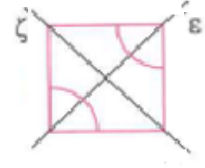
(b)



(c)



(d)



(e)

4. How many zeros does the result of the operation have?

$$25 \times 25 \times 25 \times 25 \times 25 \times 25 \times 25 \times 4 \times 4 \times 4 \times 16 \times 16$$

(a) 6

(b) 7

(c) 10

(d) 12

(e) 14

5. Christos has 11 pieces of paper. He cuts some of them into three smaller pieces each. After that, he has exactly 29 pieces of paper. Find how many cards from the initial 11 he cut.

(a) 6

(b) 7

(c) 8

(d) 9

(e) 10

6. Find the digit of the units of the following operation:

$$(5 + 1) \times (5^3 + 1) \times (5^6 + 1) \times (5^{12} + 1)$$

- (a) 6 (b) 5 (c) 2 (d) 1 (e) 0
-

7. Find the 50th term of the following sequences:

$$5, 6x, 7x^2, 8x^3, 9x^4, \dots$$

- (a) $54x^{49}$ (b) $54x^{50}$ (c) $45x^{50}$ (d) $55x^{49}$ (e) $46x^{51}$
-

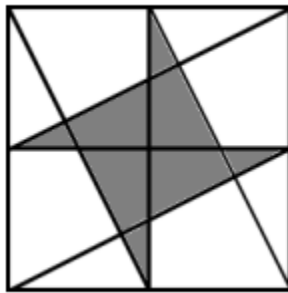
8. In a toy factory, a person can make **K** toys in an hour. Anna started work at 10:00 am, Nikos started work at 10:20 am, and Maria and Nicki started work at 10:40 am. Everyone works at the same pace and produces 28 games altogether by 11:00 am. Find the value of **K**.

- (a) 8 (b) 10 (c) 12 (d) 14 (e) 16
-

9. A four-digit number can be written by repeating a two-digit number. For example, 1111 can be written if you repeat the number 11 and 1919 can be written if you repeat the number 19. How many such numbers are there between the numbers 2000 and 10000?

(a) 80 (b) 81 (c) 79 (d) 72 (e) 70

10. In the figure below, the vertices of the shaded triangles end in the middle of each side of the large square. Find the fraction of the area of the square that is not shaded.



(a) $\frac{4}{5}$ (b) $\frac{3}{4}$ (c) $\frac{2}{3}$ (d) $\frac{5}{8}$ (e) $\frac{3}{5}$

11. In a sequence of numbers, each number except the first, equals twice the previous number. If the sum of the second and third numbers in the list is 24, then what is the sixth number?

(a) 40 (b) 64 (c) 112 (d) 128 (e) 192

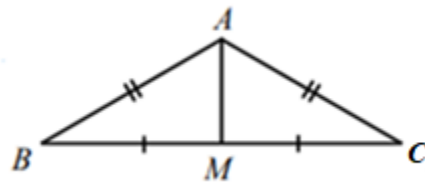
12. What is the greatest number of Mondays that can occur in the first 45 days of a year?

(a) 5 (b) 6 (c) 7 (d) 8 (e) 9

13. The following ratios are equal to $15 \div 60$ except:

- (a) $\frac{1}{2} \div 2$ (b) $1 \div \frac{1}{4}$ (c) $1111 \div 4444$ (d) $1 \div 4$ (e) $30 \div 120$
-

14.



In the above diagram, triangle ABC is isosceles. M is the mid point of BC. If the perimeter of triangle ABC is 64cm and the perimeter of triangle ABM is 40cm, what is the length of AM?

- (a) 10 (b) 8 (c) 16 (d) 12 (e) 24
-

15. In a basketball shooting competition, each competitor shoots ten balls which are **numbered from 1 to 10**. The number of points earned for each successful shot is equal to the number on the ball. If a competitor misses exactly two shots, which one of the following scores is not possible?

(a) 52

(b) 44

(c) 41

(d) 38

(e) 35

END OF PART A

PART B – PROBLEMS

- Answer ALL questions.
 - Show your workings clearly.
-

1. Find which number you must replace ? with, so the fraction is equal to 4.

(3 marks)

$$\frac{? \div (3 + 6 \times 3 - 6)}{(3^3 \div 9)} = 4$$

Answer: _____

2. If 40% of P is 10% of K, find what percentage of P is K.

(2 marks)

Answer: _____

3. The sum of five consecutive numbers is 2000. Find which is the largest of the five number.

(consecutive numbers: the numbers that follow each other, in order from the smallest to the largest)

(3 marks)

Answer: _____

4. In the following row there are 10 numbers. The first is 2, the second 22 and the third 222 etc

2, 22, 222, ..., 2222222222

If you add all the above numbers, find which digit is in the place of the hundreds.

(3 marks)

Answer: _____

5. A container full of water weighs 15 kg. If we empty $\frac{3}{4}$ of the water, the container (along with the rest of the water) will weigh 6 kg. Find how many kilos the container weighs when it is empty.

(3 marks)

Answer: _____

6. Sixth formers will donate some books to a library. The books are less than 300. If they are packed in boxes of 24 or 36, no books are left. If they are packed in boxes of 25, then 16 are left. Find how many books they will be donated to the library.

(3 marks)

Answer: _____

7. Each of the numbers 1, 5, 6, 7, 13, 14, 17, 22, 26 should be placed in a different circle below. The numbers 13 and 17 are placed as shown.

Katerina calculates the average of the numbers in the first three circles, the average of the numbers in the middle three circles and the average of the numbers in the last three circles. These three averages are equal.

What number is placed in the shaded circle? Fill the empty circles with the correct numbers.

(3 marks)



Answer:

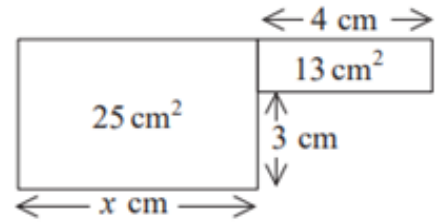


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8. In a group of 48 children, the ratio of boys to girls is 3 : 5. How many boys must join the group to make the ratio of boys to girls 5 : 3?

(3 marks)

Answer: _____

9. The areas of the rectangles in the figure are 25cm^2 και 13cm^2 .
Find the perimeter of the large rectangle as shown.



(4 marks)

Answer: _____

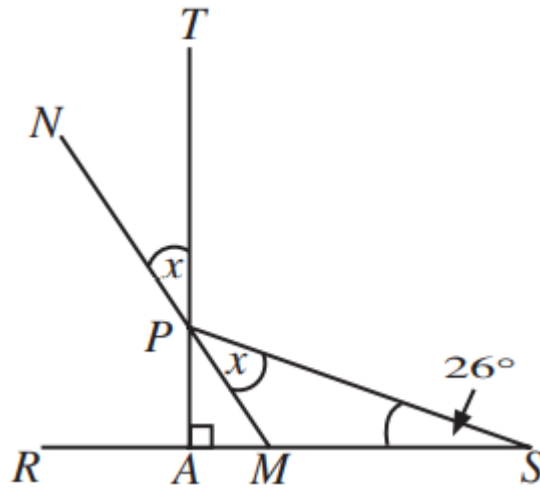
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10. $\frac{3}{5}$ of the students who took part in the 1st phase of a Maths competition were girls. There were 10 more girls than boys. 20% of the girls and 25% of the boys qualified to the 2nd phase of the competition. Find what percentage of students who took part in the 1st phase qualified to the 2nd phase.

(4 marks)

Answer: _____

11. In the figure below the angle $PSM = 26^\circ$ and PT is perpendicular to RS . Find angle x .

(4 marks)



Answer: $x =$ _____

12. In the 4x4 box, each row, column and diagonal must have one of the numbers 1, 2, 3 and 4.
Find the value of $K+N$.

(3 μονάδες)

| | | | |
|-----|-----|-----|-----|
| 1 | F | G | H |
| T | 2 | J | K |
| L | M | 3 | N |
| P | Q | 1 | R |

Answer: _____

13. The scales below balance as you can see. Find how many squares weigh the same as one circle.

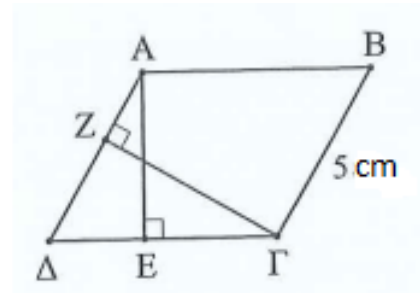
(3 marks)



Answer: _____

14. The following applies to the ABCD parallelogram of the following figure:

- Side BC is 5cm.
- Its perimeter is 22cm.
- The height of AE is equal to $\frac{2}{3}$ of CD.



a) Find the height CZ.

(3 marks)

Answer: _____

b) Rectangle KLMN has sides equal in length to the sides of the above parallelogram ABCD. Find what percentage (%) the area of KLMN is larger than the area of ABCD.

(3 marks)

Answer: _____

- 15.** In a class, there is an equal number of boys and girls. After nine girls leave the classroom to take part in a show, the number of boys in the class is twice the number of girls. Find how many boys and girls in total had been in the class before the nine girls left.

(3 marks)

Answer: _____

END