

Surname _____

Name _____

Father's name _____



THE G C SCHOOL OF CAREERS

MATHEMATICS SCHOOL



MATHEMATICS APTITUDE TEST

2021-2022

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!

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 3 marks.

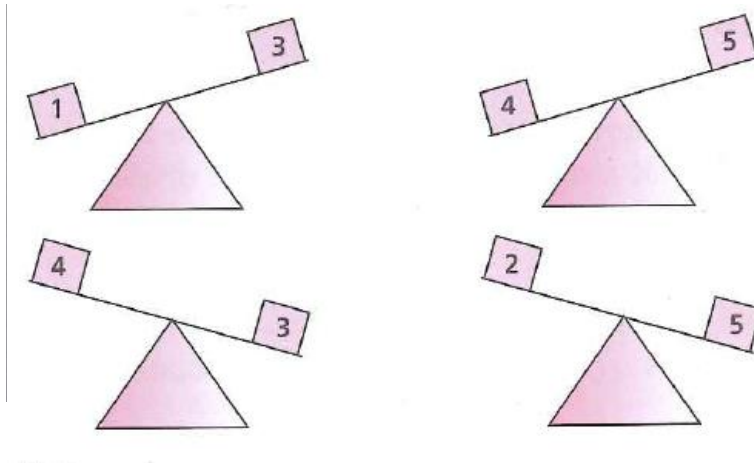
45 marks

1. Find the value of:

$$\frac{22 \times 22 \times 22 \times 22 \times 22}{11 \times 11 \times 11 \times 11 \times 11} + \frac{22 + 22 + 22 + 22 + 22}{11 + 11 + 11 + 11 + 11}$$

- (a) 11 (b) 22 (c) 33 (d) 34 (e) 44
-

2. Find which box is the lightest.



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

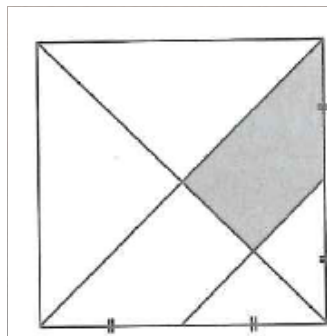
3. Find which of the following has the largest value.

- (a) 1 (b) $\frac{1}{\frac{1}{2} + \frac{1}{3}}$ (c) $\left(1 + \frac{1}{10}\right)^3$ (d) $\frac{1 + \frac{1}{6}}{1 - \frac{1}{6}}$ (e) $\left(1 - \frac{1}{10}\right)^3$
-

4. If A is 25% of 40, 10 is 25% of B and 10 is C% of 40, find the sum of A + B + C.

- (a) 50 (b) 65 (c) 70 (d) 75 (e) 80
-

5. A square is divided as shown in the figure below. Find which fraction of the area of the square is shaded.

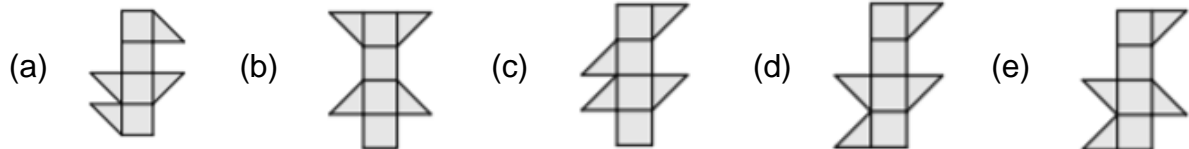


- (a) $\frac{1}{16}$ (b) $\frac{2}{16}$ (c) $\frac{3}{16}$ (d) $\frac{2}{8}$ (e) $\frac{3}{8}$
-

6. Find how many digits the number $2^1 \times 3^2 \times 4^3 \times 5^4$ has.

- (a) 5 (b) 6 (c) 7 (d) 8 (e) none of these

7. Which one of the following could be folded to form a cube?



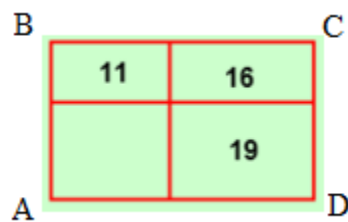
8. When you add the first 98 numbers, 1, 2, 3, 4,, 95, 96, 97, 98 the result is a four digit number. Find the last digit of this number.

- (a) 9 (b) 8 (c) 0 (d) 2 (e) 1

9. Two of the cups below have coffee, two more have milk and only one has cocoa. If the weight in grams in the cups of coffee is twice the weight in grams in the cup of cocoa, in which cup is the cocoa?



10. A rectangle ABCD is divided into 4 smaller rectangles as shown below. The perimeter of the three smaller rectangles is 11, 16 and 19 metres. Find the perimeter of ABCD.



- (a) 28 (b) 30 (c) 32 (d) 38 (e) 40
-

11. 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?

(a) 8 (b) 24 (c) 32 (d) 40 (e) 48

12. If you reverse the two digits of each one of the numbers in the multiplication below, the product remains the same.

$62 \times 13 = 806$ $26 \times 31 = 806$

For which one of the multiplications below does this also apply to?

(a) 25×36 (b) 34×42 (c) 54×56 (d) 42×48 (e) 32×43

13. Three years ago, the sum of the ages of triplets John, Anna and George and their brother Costas who is 4 years older, was twenty-four. How old is Costas now?

(a) 10

(b) 11

(c) 12

(d) 14

(e) 16

14. μ , ν , M , N are four positive numbers.

If you know that $0 < \mu < \nu$ and $0 < M < N$, find which of the following fractions has the smallest value.

(a) $\frac{\mu}{M}$

(b) $\frac{\mu}{N}$

(c) $\frac{\nu}{M}$

(d) $\frac{\nu}{N}$

(e) it depends on the numbers

15. Three boxes contain apples or pears or both. Each box contains the same number of pieces of fruit. The first box contains all 12 of the apples and $\frac{1}{9}$ of the pears.

How many pieces of fruit are there in each box?

(a) 13

(b) 16

(c) 18

(d) 20

(e) 36

END OF PART A

YOU CAN CONTINUE WITH PART B

PART B – PROBLEMS

- Answer ALL questions.
- Show your workings clearly.
- If you face difficulties in any question, put a star next to its number and continue with the next one. If you have time at the end, go back and try again.

55 marks

1. Find which number you must replace «?» with, so the fraction is equal to 5.

(4 marks)

$$\frac{? \times (6 - 3 \times 2 + 4)}{(2^3 \times 10) \div (2^2 \times 5)} = 5$$

Answer: _____

2. Maria has € 13, Katerina € 77 and Athena has as many more euros than Maria as she has fewer than Katerina. Find how many euros Athena has

(3 marks)

Answer: _____

3. Anna and Manolis travel on the same train. Anna is sitting in the 17th carriage from the front of the train. Manolis is sitting in the 34th carriage from the end of the train. They look at each other and realise that they are sitting opposite to each other in the same carriage. Find how many carriages the train has.

(3 marks)

Answer: _____

4. After playing 500 games, my success rate is 49%. Assuming that I win every game from now on, find how many extra games I need to play in order for my success rate to increase to 50%.

(3 marks)

Answer: _____

5. 60% of the spectators in a movie theatre are adults. The rest of the spectators are children, $\frac{3}{4}$ of whom are boys. The girls are 150 fewer than the adults. Find how many adults and how many children are in the movie theatre.

(4 marks)

Answer: Adults _____

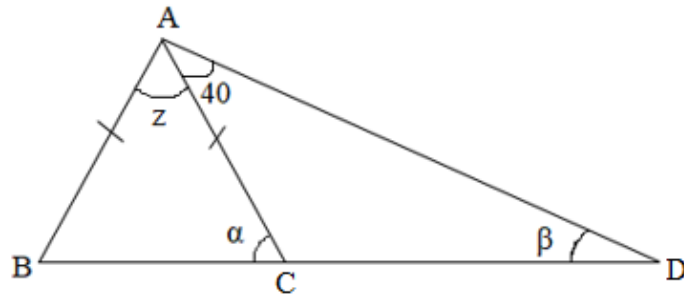
Children _____

6. The sum of two integers is 70. If we multiply the largest of these two numbers by 6, we get the same result as when we multiply the smaller of the two numbers by 8. What is the largest number?

(4 marks)

Answer: _____

7. In the diagram below ABC is an isosceles $AB = AC$ triangle and $\alpha : \beta = 2 : 1$.
Find angle z . **(4 marks)**



Answer: _____

8. Christos thought of two numbers with sum 20. Five times one number is 10 more than four times the other number. Find the product of these two numbers. **(3 marks)**

Answer: _____

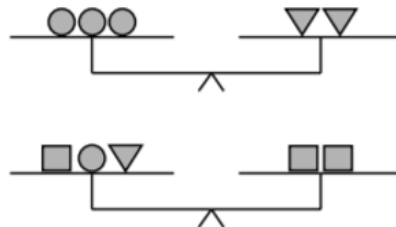
9. Every book has numbered pages 1, 2, 3, 4, 5,
 (for example, a book with 252 pages has numbered pages 1, 2, 3, ..., 252).
 I have just bought a book. If I place the page numbers of my book next to each other,
 I will end up with a number with 35 digits. How many pages does my new book have?

(3 marks)

Answer: _____

10. The two equal scales below are balanced. Find which other four shape combinations have the same mass as $\bigcirc \nabla \nabla \nabla$.

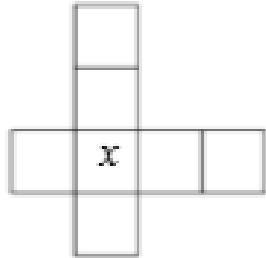
(3 marks)



Answer: _____

11. The numbers 2, 3, 4, 5, 6, 7, 8 are to be placed, one per square, in the diagram shown such that the four numbers in the horizontal and vertical row and column add up to 21. Which number should replace x .

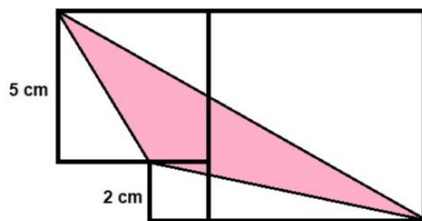
(4 marks)



Answer: _____

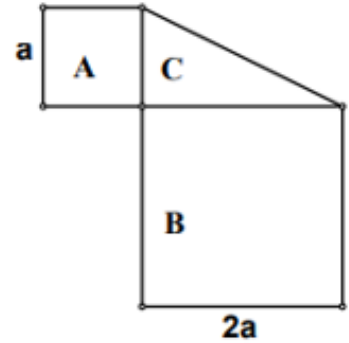
12. The diagram below shows three squares. The length of the sides of the two smaller squares is 2 cm and 5 cm as shown. Find the area of the shaded region.

(4 marks)



Answer: _____

13. Let A , B and C be the areas of the two squares and the right-angled triangle, in the shape on the right. The length of the sides of the small and large squares are a and $2a$ respectively. Find the value of $\frac{B+C}{A}$.



(3 marks)

Answer: _____

-
14. In 2017, price increase of petrol was 10% of the previous year's price. In 2018, the price increase was 20% of the previous year's price and in 2019 the price decreased by 30% compared to the previous year's price. Find the total (%) change over the three years (2017-2019).

(4 marks)

Answer: _____

15. We write the numbers as shown in the figure below. Find what number will be in the square in the 30th row and in the 25th column.

(For example, 5 is in the 3rd row and in the 2nd column and 13 is in the 5th row and in the 3rd column.)

(4 marks)

1				
2	3			
4	5	6		
7	8	9	10	
11	12	13	14	15

Answer: _____

END

TOTAL MARK 100