**GRADE 8 EXCELLENT STUDENT SURVEY**

**SCHOOL YEAR 2023 – 2024**

**SUBJECT: MATHEMATICS**

***Duration: 150 minutes (excluding the duration of the lesson)***

**Question 1 (2.5 points).**

**1.** Analysis of the following polynomials into factors:

a) 

b) 

**2**. For Expressions 

a) Search for the determining condition and abbreviate it.

b) Find  to .

c) Find the smallest value of  the 

**Question 2 (2.0 points).**

**1.** Give a,b,c a couple of different satisfactions: 

Prove that: 

**2**. For polynomials:  where a, b, c are real numbers. Know the polynomial f(x) divided by the polynomial x + 1 residual – 4 and divided by the polynomial x – 2 residual 5. Calculate the value of



**Question 3 (1.5 points).**

**1.** Solving equations: 

**2.** Find all pairs of integers  that satisfy the equation:



**Question 4 (3.0 points).**

Give the  right triangle a balance at . On the opposite ray of the ray  take the point  so that . Called the  perpendicular projection of the  top,  cut  at . Called  the midpoint of  and , respectively,  is the point of three points apart. Prove that:

a) 

b) 

c) 

d) Regular-grade lines.

**Question 5 (1.0 points).**

1) Two distinct numbers are randomly selected from the set 

and multiply together. What is the probability of multiplying by 0?

2. Given a,b,c are the satisfactory positive numbers: .

Demonstrate: 

*---------------***End***--------------*

|  |  |  |  |
| --- | --- | --- | --- |
|  | |  | |
| **Sentence** | **Answer** | | **Point** |
| **Question 1**  **(2.5 points)** | **1. (1.0 points)** | | |
| a)    = | | **0,25** |
| = | | **0,25** |
| b) (x – y)3 + (y – z)3 + (z – x)3 | |  |
| Đặt x – y = a , y – z = b, z – x = c thì a + b + c = 0. | | **0,25** |
| So: | | **0,25** |
| **2. (1.5 points)** | | |
| a) **(0.5 points)** | | |
|  | | **0,25** |
| We have:      So,  with . | | **0,25** |
|  | | |
| b) **(0.5 points)** | |  |
| To reach  out to deduce  with | | **0,25** |
| Because you should choose  So | | **0,25** |
| **c) (0.5 points)** | |  |
| We have:  With  the reason  and . Apply the Colossian real estate to 2 positive numbers  and  we have: | | **0,25** |
| The sign « = » with ( Agreement of the Land Registration Agreement)  So | | **0,25** |
| **Question 2**  **(2.0 points)** |  | | |
| **2.1. ( 1.0 points)** Give a,b,c a couple of different satisfying:  Prove that: | |  |
| **We have:** | | **0,25** |
|  | | **0,25** |
| Similar: | | **0,25** |
| Therefore: | | **0,25** |
| **2.2. (1.0 points)** For polynomials:  where a, b, c are real numbers. Know the polynomial f(x) divided by the polynomial x + 1 residual – 4 and divided by the polynomial x – 2 residual 5. Calculate the value of | |  |
| The polynomial f(x) is divided by the polynomial x + 1 remainder – 4, so we have:  (1) | | **0,25** |
| The polynomial f(x) divided by the polynomial x - 2 is the remainder of 5, so we have:  (2) | | **0,25** |
| From (1) and (2) | | **0,25** |
|  | |  |
| So: | | **0,25** |
| **Question 3(1.5 points)** | **3.1.(0.75 points):** Solving equations: | | |
| Since  it is not the solution of the equation, we can divide both sides  : | | **0,25** |
| Put | | **0,25** |
| With:    With:  Inactive equations  So the equation has 2 experiments: | | **0,25** |
| **3.2. (0.75 points)** | | |
| (\*)  Because  with everything  the word (\*) we have | | **0,25** |
| Therefore  ,  With  instead of the equation we can  With  instead of the equation we have  (type)  With  instead of the equation we have  (type)  With  instead of the equation we can | | **0,25** |
| So the pairs of integers (;) to look for is | | **0,25** |
| **Question 4. (3.0 points)** | **4.(3.0 points)** | |  |
|  | | 0,25 |
| **a) (0.75 points).** | | |
| Consideration  and  Yes  (same as  )  , | | 0,25 |
| = (g-c-g) | | 0,25 |
|  | | |
| **b) (0.75 points).** | |  |
| We have  *(1)* (because  the two midlines correspond to the hypotenuse of the two right triangles  and )  Similar Yes  ( as evidenced above) (3)  The words (1), (2) and (3)  quadrilateral  are diamonds. | | 0,25 |
| ΔAEC and ΔAFB have  = | | 0,25 |
| Which  It is inferred that a quadrilateral  is a square.  =>AK is the discerning ray of | | 0,25 |
| **C) (0.75 points).** | |  |
| and  common  ,  (g-g) | | 0,25 |
|  | |  |
| (c-g-c) | | 0,25 |
|  | | 0,25 |
| **d) (0.75 points).** | | |
| A quadrilateral  is a square that deduces  and  intersects at the midpoint of each line.  square at ,  square at   , which    is the direct line of . | | 0,25 |
|  | Which  is the direct line of .  which | | 0,25 |
| Extrapolating a quadrilateral  is a parallelogram that deduces  and  intersects at the midpoint of each line.  So  the same rule. | | 0,25 |
| **Question 5**  **(1.0 points).** | **5.1(0.5 points)** | | |
| **1.** Two numbers that can be distinguished randomly from the set  and multiply together. Ask what is the probability of multiplying by 0 | |  |
| Possible cases are:    And vice versa, change the position of two numbers in the above pairs of numbers | | **0,25** |
| The number of results that occur when choosing two distinct numbers from the given set is 15.2=30  When the product of the two selected numbers is 0, the first term is equal to 0 or the second term is equal to 0, we have 10 such cases.  So the probability to look for is | | **0,25** |
| **5.2 (0.5 points)** | |  |
| **2.** Given a,b,c are the satisfactory positive numbers: .  Demonstrate: | |  |
| Applicable to Phone: AM – GM we have:  (1) | | **0,25** |
| with every a,b,c    Similar proofs:    From (1) and (2)  The "=" sign occurs when and only when: | | **0,25** |
|  |

**Note:** *If the student presents a different method that is correct, the maximum score will be given in the sections.*