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| **PEOPLE’S COMMITTEE OF**  **VINH BAO DISTRICT**  **JUNIOR HIGH SCHOOL**  **GIANG BIEN** | **VINH BAO MATHEMATICS COMPETITION**  **FOR GRADE 7 STUDENTS**  **SCHOOL YEAR: 2023 – 2024**  *Time allowance: 120 minutes* |

***PART 1: MULTIPLE – CHOICE ( 100 mark)***

**Question 1. How many integer x such that x2-4 >=0**

Answer:……………………..

**Question 2:** What is the positive square root of 64?

Answer:……………………..

**Question 3:**  Find the natural number n such that (n-3).(n+3)=9991

Answer:……………………..

**Question 4:** Given that g (x)=2x+1

Calculate g(0)+g(1)+…+g(9)=

Answer:……………………..

**Question 5:** Let f(x) be the function of x in the table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | 1 | 4 | 9 | 11 |
| f(x) | 5 | 3 | 0 | -6 |

Calculate f(4)+f(9)

Answer:……………………..

**Question 6**: Given the frequency table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Value (x) | 2 | 4 | 7 | 9 |  |
| Frequency (n) | 7 | 5 | 6 | 2 | N=20 |

Which value has the greatest frequency

Answer:……………………..

**Question 7:** Choose the equilateral triangle

1. Triangle ABC has <A=600; AB=AC
2. Triangle DEF has <E=600; <F=600
3. Triangle MNP has MN=MP=NP

Answer:……………………..

**Question 8:** Let ABC be right triangle at A, AB=2; AC=6; BC=

The value of a is

Answer:……………………..

**Question 9:** Given that =; = and x-y+z=32

In x, y, z which numbers are a factor of 84

Answer:……………………..

**Question 10:** It is given |a| = 2, |b| = 3, |c| = 4, a > b > c. find the value of a + b – c?

Answer:……………………..

(***PART II: COMPOSE (200 mark)***

**Question 1:**

**a)**Given are real number such that and . Prove that

b) Let x, y,z such that  and .

Find the x, y , z

**Question 2:** Let ABC is an equilateral triangle. M is a point inside the triangle such that

MA : MB : MC = 3:4:5 Calculate angle measure AMB.

**Question 3:** Suppose 22020 has m-digit natural number and 52020 has n-digit natural number (decimal system). Find the value of m + n ?

**Question 4:** Let a, b, c are leghths of the three sides of a triangle

Prove that: 

----------------------THE END----------------------

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| --- | --- |
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**SOLUTIONS – MARKS**

***PART 1: MULTIPLE – CHOICE ( 100 mark)***

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Question*** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| Anser | infinite | 8 | 100 | 100 | 3 | 2 | All three triangle | 40 | z | 3 |
| Marks | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 |
| ***PART II: COMPOSE (200 mark)*** | | | | | | | | | | |

|  |  |  |
| --- | --- | --- |
| **Question** | **Answer** | **Point** |
| **1**  **50mark** | 1. From | **10** |
| and | **10** |
|  | **10** |
| b.We have    20z – 24y = 30x -20z = 24y -30x = 0  20z = 24y = 30x  10z = 12y = 15x    : x = 12 ; y = 15 và z = 18 | **10**  **10** |
| **2**  **50mark** | Because  => suppose  => MA = 3a, MB = 4a, MC = 5a  On the half-plane of the bank AC construct an equilateral triangle AMN  => AM = AN = MN = 3a và  Consider ΔABN and ΔACM have  AB = AC (gt) (1) ; AN = AM = 3a (2)  (3)  From 1,2,3 => ΔABN = ΔACM (c.g.c)  => BN = CN = 5a.  Δ BMN have BN2 = (5a)2 = 25a2  BM2 + MN2 = (4a)2 + (3a)2 = 25a2  => BN2 = BM2 + MN2 => BMN be right triangle at M (định lí Pytago đảo)  =>  => | **20**  **10**  **20** |
| **3**  **50mark** | m=6  n=0  m+n=6 | **20**  **20**  **10** |
| **4**  **50mark** | :    +) Applying triangle equation, we have: a < b + c  =>.a2 < ab + ac  Similar: b2 < ba + bc; c2 < ca + cb  ⇒ a2 + b2 + c2 < ab + ac + ba + bc + ca + cb =2(ab+bc+ca) (2)  From (1) and (2) =>dpcm | **20**  **30** |