Regional Math Bee – Round 1 (3^{rd}-4^{th})

Regulation Tossups

(1) **Read Twice. Computation Basic** - *Two answers required; give your answers as decimal numbers with two decimal places each.* Find both of the missing numbers to complete this pattern of decimals: 7.74, 7.80, BLANK, BLANK, 7.98, 8.04.

ANSWER: **7.86 and 7.92** (accept answers in either order, but prompt on just one)

(2) **Non-Computation** - Two distinct points determine exactly one of these objects in Euclidean geometry. Parallel examples of these objects have the same slope, while perpendicular examples have slopes that are negative reciprocals of one another. For the point, name this straight path that extends without end in both directions.

ANSWER: **line**

(3) **Read Twice. Computation Basic** - Evaluate this expression: 108 divided by 12 plus 1.

ANSWER: **10**

(4) **Read Twice. Computation Pyramidal** - Matt wants to determine the total cost of 5 chocolate bars and 4 drinks if the chocolate bars are 3 dollars apiece and the drinks are 2 dollars apiece. One way to determine this is to let c equal the cost of a chocolate bar and d equal the cost of a drink, and then determine the value of the expression 2c plus 2d. Using that or any other method , for the point, determine the total cost of the chocolate bars and the drinks.

ANSWER: $**23**

(5) **Read Twice. Computation Basic** - If a rectangle has side lengths 7 and 29, what is its area?

ANSWER: **203**

(6) **Read Twice. Computation Basic** - What is the perimeter of a regular hexagon with a side length of 15?

ANSWER: **90**

(7) **Non-Computation** - This thinker published his laws of motion in *Principia Mathematica*. Despite being years ahead of Gottfried Leibniz, this man shares credit for developing calculus. For the point, identify this English polymath who allegedly discovered gravity after an apple fell on his head.

ANSWER: Sir Isaac **Newton**

(8) **Read Twice. Computation Basic** - What is two-thirds of 27?

ANSWER: **18**

(9) **Read Twice. Computation Pyramidal -** Madison is deciding what size square pizza to order: she can either spend $10 on a regular-sized pizza, or $25 on a square pizza whose side length is double that of the regular. To calculate how many times larger the area of the larger pizza is than that of the smaller pizza, she replaces x in the formula x times x with 2 x and gets , for the point, that the area is how many times larger?

ANSWER: **4**

(10) **Read Twice. Computation Basic** - What is 2,345 plus 3,018?

ANSWER: **5,363**

(11) **Read Twice. Computation Basic** - In simplest terms, what is negative 9 times one-third?

ANSWER: **negative 3**

(12) **Non-Computation -** This type of number can be written in the form 2n, where n is an integer. These numbers have a remainder of zero when divided by two. The last digit of a positive example of this type is always 0, 2, 4, 6, or 8. For the point, name these numbers that alternate with odd numbers on the number line.

ANSWER: **even** numbers

(13) **Read Twice. Computation Basic** - A square notepad has sides that are 9 centimeters long. In square centimeters, what is the area of the notepad?

ANSWER: **81** square centimeters

(14) **Read Twice. Computation Pyramidal -** You want to calculate your chance, in simplest form, of winning a random lottery that has 60 entries and 30 winners. To do this, you can take the number of winners and divide it by the number of entries, and then multiply by 100%. For the point, what is the probability you win this lottery?

ANSWER: **50%** (or **one-half**; or **0.5**)

(15) **Read Twice. Computation Basic** – *Give your answer in simplest fractional form.* Given that Ray has rolled 4 sixes in a row on a fair six-sided die, what is the chance that he rolls another 6 on his next roll?

ANSWER: **1/6** (or **one-sixth**)

(16) **Read Twice. Computation Basic** - What is one-half plus one-sixth in simplest fraction form?

ANSWER: **2/3** (or **two-thirds**)

(17) **Non-Computation -** Borrowing, also called regrouping, is sometimes used when performing this operation with multi-digit numbers. On a number line, this operation can be modeled by moving to the left. This operation finds the difference between two numbers and is the inverse of addition. For the point, name this arithmetic operation symbolized by a minus sign.

ANSWER: **subtraction** (accept **minus** before it is said)

(18) **Read Twice. Computation Basic** - *Round your answer to the nearest integer.* What is 503 divided by 10?

ANSWER: **50**

(19) **Read Twice. Computation Pyramidal -** Andrew walks 5 miles east, 12 miles north, then 13 miles directly back to where he was. He wants to figure out the area of the shape traced by his path. Since he walked in three different directions, he concludes that he traced out a triangle. He then multiplies the base and height, then divides by 2 to determine the area is, for the point, how many square miles?

ANSWER: **30** square miles

(20) **Read Twice. Computation Basic** - What is 932 divided by 4?

ANSWER: **233**

(21) **Read Twice. Computation Basic** - In simplest fractional form, what is five-twelfths times four-fifths?

ANSWER: **1/3** (or **one-third**)

(22) **Non-Computation -** Quantum instances of these machines use superposition in their qubits. Charles Babbage designed the earliest known example of these machines, practical implementations of which include ENIAC. For the point, IBM pioneered what devices that have an operating system and a CPU?

ANSWER: **computers** (accept **quantum computers**)

(23) **Read Twice. Computation Basic** - What is the measure in degrees of the other non-right angle of a right triangle that has one angle measure of 31 degrees?

ANSWER: **59** degrees

(24) **Read Twice. Computation Pyramidal -** Samantha wants to calculate the area of a square whose diagonal is 8 meters long. To do this, she multiplies the diagonal by itself, then halves it. For the point, what does Samantha calculate the area of this square to be?

ANSWER: **32** square meters

(25) **Read Twice. Computation Basic** - What digit is in the tens place of 1415 times 1000?

ANSWER: **0**

Extra Questions

(1) **Read Twice. Computation Basic** - A two-digit number is chosen at random. What is the probability that it is a multiple of 10?

ANSWER: **0.1** (or **10%**; or **1/10**; or **one-tenth**)