

Regional Math Bee – Round 1 (5th-6th)

Regulation Tossups

(1) **Read Twice. Computation Basic** – Give an exact answer, not an estimate. What is the area of a circle with a diameter of 16?

ANSWER: 64 pi

(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** - Solve the equation $2.5x$ equals 27.5 for x .

ANSWER: 11

(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** - The square of what positive number is equal to negative 21 times negative 14 plus negative 5?

ANSWER: 17

(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 1,002 minus 487?

ANSWER: 515

(9) **Read Twice. Computation Pyramidal** - Davis has five unique cars and wants to figure out how many unique ways he can order them. To do this, he can use the factorial operator, which multiplies all the numbers from 1 to the number it's given. By this definition, 5 factorial, equal to 1 times 2 times 3 times 4 times 5, yields, for the point, what number?

ANSWER: 120

(10) **Read Twice. Computation Basic** - Simplify the expression $9x^2 + x - 2x^2 + 3 + 5x - 7$ to lowest terms.

ANSWER: $7x^2 + 6x - 4$

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

ANSWER: negative 3

(12) **Non-Computation** - In advanced algebra, operations that satisfy this property are sometimes called "abelian," after the mathematician Niels Henrik Abel. When two matrices are multiplied together, this principle that holds for real numbers does not apply. For the point, name this property of operations that allows numbers to change order without changing the result, stated for addition as $a + b = b + a$.

ANSWER: commutative property

(13) **Read Twice. Computation Basic** - Round your answer to the nearest tenth of a centimeter. If there are 2.54 centimeters in 1 inch, how many centimeters are in 1 foot?

ANSWER: 30.5 centimeters (accept 30 and a half centimeters; accept 30.48 centimeters, the exact answer accept 30 and twenty-four twenty-fifths centimeters)

(14) **Read Twice. Computation Pyramidal** - Michael wants to play several rounds of golf. He has \$280, and each round of golf costs \$40 to play. One way to figure out how many rounds of golf he can afford to play is to write an equation where x equals the amount of money he has divided by the per-round cost of golfing. Using that or any other method, for the point, how many rounds of golf can Michael play?

ANSWER: 7

(15) **Read Twice. Computation Basic** - A treasure map has a chest at the point (negative 5, 2). If you move it 3 units to the right and 4 units down on a graph, what is the map's new coordinate?

ANSWER: (-2, -2) (or (negative 2, negative 2))

(16) **Read Twice. Computation Basic** - Simplify the expression 4 times the quantity (3x minus 2).

ANSWER: $12x - 8$

(17) **Non-Computation** - A correct one of these procedures always produces a solution in a finite number of steps if a solution exists. In computer science, common examples of this concept include procedures for sorting lists and searching databases. For the point, give this term for a precise, repeatable procedure or method used to solve mathematical or computational problems.

ANSWER: algorithms

(18) **Read Twice. Computation Basic** - Round the number 28 million, 632 thousand, 2 hundred and 20 to the nearest hundred thousand.

ANSWER: 28,600,000 (twenty-eight million, six hundred thousand)

(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** - Give your answer in decimal form. If 32 over 5 equals x over 11, what is x?

ANSWER: 70.4

(21) **Read Twice. Computation Basic** - If y equals two-fifths x plus 2, what is the value of y when x equals negative 5?

ANSWER: 0

(22) **Non-Computation** - On a bar graph or histogram, the height of each bar represents this quantity. In probability experiments, experimental probability is found by dividing this number for an event by the total number of trials. If the value 7 appears three times in a data set, then its value for this is three. For the point, name this term for how often something occurs in a set of data, also used as a term in radio.

ANSWER: frequency (prompt on “how often something occurs” or similar)

(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** - An aspiring gopher living 150 feet underground climbed 29,180 feet to reach the top of a tall mountain and wants to know how far above the ground he is. To find this out, the gopher finds the sum of the amount he climbed and where he started to determine that this mountain is, for the point, how far above the ground?

ANSWER: 29,030 feet

(25) **Read Twice. Computation Basic** - Consider the following set of numbers (read slowly): 5, 4, 2, 8, 2, 3, 9, 9. What is the median of this set of numbers?

ANSWER: 4.5 or 4 and a half

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)