Regional Math Bee – Round 2 (5^{th}-6^{th})

Regulation Tossups

(1) **Read Twice. Computation Basic** – In simplest fractional terms, what is two-fifths divided by three-sevenths?

ANSWER: **14/15** (or **fourteen-fifteenths**)

(2) **Read Twice. Computation Pyramidal** - Jennifer rolls a square with a side length of 5 meters on the ground. It stops after completing 8 full rotations, and Jennifer wants to figure out how far it traveled. To do this, she calculates the object's perimeter and multiplies it by the number of rotations to find that , for the point, the square rolled how far?

ANSWER: **160** meters

(3) **Read Twice. Computation Basic** – If x equals negative 3 plus 6, and y equals x squared, what is 2 y plus negative 5?

ANSWER: **13**

(4) **Non-Computation** - In the order of operations, these symbols are handled before exponents, multiplication, division, addition, or subtraction. Removing these symbols without changing the expression may sometimes require using the distributive property. For the point, name these grouping symbols written as curved marks around numbers or expressions.

ANSWER: **parentheses** (accept **brackets**)

(5) **Read Twice. Computation Basic** – Find the distance between the points P(3,7) and Q(3,-2).

ANSWER**:** 9

(6) **Read Twice. Computation Basic** – Solve the equation x + 2.65 = 6.48 for x.

ANSWER: **3.83**

(7) **Read Twice. Computation Basic -** What is the name of the geometric shape whose interior angles always sum to exactly 540 degrees?

ANSWER: **pentagon** (accept **5-gon**)

(8) **Read Twice. Computation Basic** – If 5 pencils cost $2.50, how much will 12 pencils cost?

ANSWER: **$6.00**

(9) **Non-Computation** - Interface, linker, runtime, and syntax are all types of this thing in computer science. In measurement and estimation problems, this term describes the difference between an estimated value and the exact value. Scientists try to reduce this quantity by using better tools and more careful methods. For the point, name this word for a mistake or the amount by which a value is incorrect, also applied to an event in baseball where a fielder drops a ball.

ANSWER: **error**

(10) **Read Twice. Computation Pyramidal** - Maria has 260 stickers. She gives 40 to her sister and then splits the remaining stickers equally among 5 of her friends. By subtracting the number of stickers that she gave to her sister from her original total, and then dividing that result by the number of her friends, one can calculate that, for the point, Maria gave how many stickers to each of her friends?

ANSWER: **44**

(11) **Read Twice. Computation Basic** – In simplest fractional terms, what is three-eighths times one-fourth times six?

ANSWER: **9/16** (or **nine-sixteenths**)

(12) **Read Twice. Computation Pyramidal -** Jonathan has 12 gems in a bag: 5 sapphires, 4 emeralds, and 3 topazes, and wants to determine the percentage of topazes in the bag. To do this, he can use the ratio of the number of topazes in the bag, multiply it by 100, convert it to a decimal, and find that, for the point, what percentage of the bag is topaz?

ANSWER: **25%** (accept **1 / 4** or **one-fourth** or **one-quarter**)

(13) **Read Twice. Computation Basic** – A dot plot shows the number of pets owned by 10 families. 2 of the families own 2 pets, 4 of the families own 3 pets, 3 of the families own 4 pets, and 1 family doesn't own any pets. To the nearest tenth, what is the mean, or average, number of pets that these families own?

ANSWER: **2.8** (accept **two and four-fifths**)

(14) **Non-Computation -** James Garfield published a proof of one of this mathematician's propositions by using perpendicular lines. Euclid showed that that conjecture by this mathematician holds for infinitely many unique "triples," like 7, 24, and 25. For the point, identify this ancient Greek thinker whose namesake theorem states, "a squared plus b squared equals c squared."

ANSWER: **Pythagoras** of Samos (accept **Pythagorean** Theorem)

(15) **Read Twice. Computation Basic** – Round the number 390,896 to the nearest hundred.

ANSWER: **390,900** (or **three hundred ninety thousand, nine hundred**)

(16) **Read Twice. Computation Pyramidal -** The number of goals scored by Arsenal in each of their first 5 matches is 5, 6, 2, 4, and 1, and you want to know how many goals they must score in their sixth match for their average over the six matches to be 4. Since the total goals scored over the 6 matches divided by the number of matches must be 4, you can determine that , for the point, Arsenal must score how many goals in their sixth match for their average to be 4?

ANSWER: **6**

(17) **Read Twice. Computation Basic** – Name any prime integer that is a solution to the inequality 14 is less than x is less than 36.

ANSWER: any of **17, 19, 23, 29, or 31**

(18) **Read Twice. Computation Basic** – Solve for x in the equation x divided by 12 equals 5 divided by 4.

ANSWER: **15**

(19) **Non-Computation -** The terms "tetrahedral" and "trigonal bipyramidal" refer to types of this concept used in chemistry. Plato names five regular, convex polyhedra studied in this mathematical discipline. This branch of mathematics includes the study of angles, triangles, circles, and polygons. For the point, name this field of mathematics that studies shapes and spatial relationships.

ANSWER: **geometry**

(20) **Read Twice. Computation Basic** – Solve the equation $0.2x = 0.6$ for x.

ANSWER: **3**

(21) **Read Twice. Computation Basic** – A rectangular picture frame has dimensions of 82 centimeters by 48 centimeters. To the nearest thousand, estimate its area in square centimeters.

ANSWER: **4,000** square centimeters

(22) **Read Twice. Computation Pyramidal** - Becky determined that in her last workout, she walked 4 miles and used exactly 8400 steps to do so. She can figure out how many steps per mile she averaged by writing an equation in which x equals the total number of steps taken and dividing by the distance in miles. Using that or any other method , for the point, how many steps per mile did Becky take?

ANSWER: **2,100**

(23) **Read Twice. Computation Basic** – If Daniel scored 80% on a test with 50 points, how many points did he score?

ANSWER: **40**

(24) **Non-Computation -** The Chinese *suanpan* and the Russian *schoty* were regional versions of these calculating devices. Advanced users of these devices can perform complex operations, such as extracting square roots, without touching the frame. Before the slide rule was invented, this was the most common device used for rapid computation. For the point, name this early counting tool consisting of rods and movable beads.

ANSWER: **abacus**

(25) **Read Twice. Computation Basic** – Solve the equation x + 25 = 42 for x.

ANSWER: **17**

Extra Questions

(1) **Read Twice. Computation Basic** – A school is taking 148 students on a field trip. Each bus can hold 32 students. What is the maximum number of buses on this field trip that can be completely full of students?

ANSWER: **4**