Select 15 of the following inquiries. Partial credit will not be granted for incomplete responses in absence of shown work.

1. Sarasota is located approximately 230 miles northwest of Miami. Big Cypress National Preserve is located on the eastern route about 13/20 or 65% of the total distance. Illustrate a sketch to represent this situation. Employ the ruler and/or segment addition postulate to determine each segment length and tell whether they are congruent. Label the locations appropriately and determine the distance between Big Cypress and Miami. Is the solution reasonable in the context of the original situation? Explain your reasoning. **(MA.912.G.8.2; MA.912.G.8.3; MA.912.G.1.1)**
2. The President serves as Commander-In-Chief exercising supreme command authority of a nation's military forces. The Pentagon is the headquarters of the U.S. Department of Defense. The word pentagon is a derivative from the Greek root word *pente*. Perhaps the most notable is a five-sided polygon structure located in Arlington County, Virginia. Sketch a pentagon that is equilateral but not equiangular. One side of a pentagon measures (7x - 3) inches whereas another is (4x + 6) inches. Find a side length and evaluate one of the expressions with the value of x. What is the perimeter of this pentagon? Can you find the circumference? Explain. **(MA.912.G.2.3; MA.912.G.2.5; MA.912.G.8.2; MA.912.G.8.6)**
3. A conjecture is an unproven statement based merely on observations. You can show that a conjecture is false, however, by simply identifying one counterexample. Make and test a conjecture based solely upon the previously administered Daughtry Times inquiry of your choice. Identify a counterexample. Write a conditional statement or a logical statement, which contains a hypothesis and conclusion in if-then form, the converse, the inverse, and the contrapositive. Decide whether each statement is true or false. **(MA.912.D.6.2; MA.912.G.8.2; MA.912.G.8.4)**
4. Nik Wallenda completed his 600-foot long, roughly 180-foot high skywalk in 11 minutes as scraps of cumulus clouds gusted along on winds clocked at 25-30 mph. Write a conditional or a logical statement, which contains a hypothesis and conclusion in if-then form, the converse, the inverse, and the contrapositive. Decide whether each statement is true or false. Use the Law of Detachment to make a valid conclusion in the true situation. If applicable, employ the Law of Syllogism to write a new conditional statement that follows from the pair of true statements. **(MA.912.D.6.2; MA.912.G.8.2; MA.912.G.8.4)**
5. As more school districts strive for accountability, standardized tests have proliferated. As an alternative assessment, Joe Lunchmeat was assigned an overarching culminating performance task. He elected to design an industrial strength geometry disseminating tactical urban assault robot. Each reinforced steel leg is constructed with pair of parallel bars coupled with a iron foot. As the robot proceeds forward, the leg bars remain parallel whereas the foot glides across the plane. Illustrate the diagram. As the legs progress, are there pairs of angles that remain congruent? If so, which angles? Explain how possessing parallel leg bars enables the robot's foot to remain flat on the surface as it moves. Use the applicable theorems and/or postulates to support your reasoning. Determine whether your solution is reasonable in the context of the original situation. **(MA.912.G.1.3; MA.912.G.8.3; MA.912.G.8.3)**
6. Peter Edward Rose was actively employed in Major League Baseball as a player from 1963 – 1986 and a manager from 1984 – 1989. During his prime in the seventies, he was a member of an elite squad known as The Big Red Machine. During a routine practice drill, Johnny Bench was strategically positioned 60 ft to the east while Joe Morgan was 180 ft southeast. Meanwhile, 300 ft to the north, Tony Perez was 180 ft to the west and Pete Rose was 60 ft to the northwest. The angle formed between the paths of Bench and Morgan is congruent to the angle formed by the paths of Perez and Rose. If Bench and Morgan are now 156 ft apart, how far apart are Perez and Rose? Illustrate the diagram. Classify the triangle formed by its sides, measure the angles formed, and classify the triangle by its angles. Thoroughly explain your reasoning via the applicable Congruence Postulate or Theorem. **(MA.912.G.1.2; MA.912.G.2.3; MA.912.G.4.1; MA.912.G.4.3; MA.912.G.4.4; MA.912.G.4.6)**
7. In light of a recent series of unforeseeable events, Joe Lunchmeat has desperately resorted to an infamous payday loan in the principal amount of $350 simply to retain water and power services in his domain. Multiple agencies are available; however, two reputable financial organizations have presented somewhat appealing offers. Guido Financial Services charges fees equivalent to 515% whereas their major competitor, Tony Soprano & Associates charges $475% coupled with $50 in processing fees. Define a variable. Write and solve an equation for each situation. Create a table and determine specifically from which organization would you recommend contracting security services? Graph the results. Explain your reasoning. **(MA.912.G.8.2; MA.912.G.8.3)**
8. The Secret Service is a federal law enforcement agency attached to the Department of Homeland Security. One of their primary objectives is to ensure the safety of current and former national leaders and their families. A critical task as an agent is to serve as a lookout. During his sequestration speech, the lookouts identify a suspicious individual, measure the angle of their perspective, and disseminate concerns electronically via a covert audio communication device. A strategically placed agent uses the angle to locate the suspect. Illustrate the diagram to determine specifically how many lookouts are required to locate the perpetrator. Classify the triangle formed by its sides, measure the angles formed, and classify the triangle by its angles. Thoroughly explain your reasoning via the applicable Congruence Postulate or Theorem. **(MA.912.G.1.2; MA.912.G.2.3; MA.912.G.4.1; MA.912.G.4.3; MA.912.G.4.4; MA.912.G.4.6)**
9. On May 22, 1963 – Yankee slugger Mickey Mantle hit a prodigious home run, which allegedly struck the stadium roof at 102 ft high, 363 ft from home plate or 1 ft vertically for every 3.56 ft horizontally. Make a table showing the height of the ball at every 73 ft it moves horizontally. Write a fraction that

represents the height for each foot it moves horizontally. Graph the results. What does the numerator represent? Explain your reasoning. **(MA.912.G.8.2; MA.912.G.8.3)**

10. In America, paper bills are printed by the U.S. Bureau of Engraving and Printing. The main facility comprises two adjacent buildings and the architectural style of what is generally considered the main structure is neoclassical. The main façade consists of stone columns spanning the 505-foot length. The building is 296 feet deep and 105 feet high with four wings. Illustrate *only* an applicable portion of the diagram and classify a triangular shape using the support beams by its sides and its angle measurements. Determine the measurements of each interior angle provided one of which equates to 70 degrees. What is the measure of exterior angle (2x – 5)? Explain your reasoning. Thoroughly explain your reasoning via the applicable Congruence Postulate or Theorem. **(MA.912.G.1.2; MA.912.G.2.3; MA.912.G.4.1; MA.912.G.4.3; MA.912.G.4.4; MA.912.G.4.6)**
11. Gonzaga University is a private Roman Catholic university located in Spokane, Washington with a student enrollment of 7,764 or half of Wichita State, which miraculously eliminated the number one seeded team. At a pivotal moment in the game, legendary offspring David Stockton, the gargantuan 7'1" 305 pound Polish Freshman Przemek Karnowski, and the 7'0" Canadian forward Kelly Olynyk were 15 feet from the desired target. Two of the players were 24 feet from each other adjacent to the sidelines of the basketball court. Employ the Perpendicular Bisector Theorem, its converse and concurrency of Perpendicular Bisectors of a Triangle to determine how far the target was located from each student-athlete. Illustrate the diagram and identify concurrent lines and the point of concurrency **(MA.912.G.1.2; MA.912.G.4.1 - MA.912.G.4.6)**
12. Thus far, in Geometry we have reasoned directly from given information to prove desired conclusions. In an indirect proof, you start by making the temporary assumption that the desired conclusion is false. By then showing that this assumption leads to a logical impossibility, you prove the original statement true by contradiction. Write an indirect proof regarding the infamous Atlanta Public Schools Testing Scandal. **(MA.912.G.8.2; MA.912.G.8.4; MA.912.G.8.4)**
13. The majority of the affected schools were labeled Title I, containing a high concentration of students from low-income homes coupled with relatively low graduation rates. Interestingly enough, the farther north geographically a school was located, the less likely similar issues were present; thereby, implying concerns in the southern, eastern, and western sectors. Sketch a diagram illustrating these results and explain specifically what one can derive via applying the Hinge Theorem to this scenario. **(MA.912.G.4.7; MA.912.G.8.2; MA.912.G.8.1; MA.912.G.8.6)**
14. The gear ratio of two gears in a piece of North Korean artillery is the ratio of the number of teeth of the larger gear to the smaller. In a set of three gears, the ratio of gear A to B is equal to the ratio of gear B to C. A has 36 teeth whereas C contains 16. How many does B have? Identify the means and extremes of the proportion. **((MA.912.D.6.4; MA.912.G.8.2; MA.912.G.8.4; MA.912.G.8.5;))**
15. The Ryugyong Hotel stands 1080 ft making it the most prominent feature of Pyongyang's skyline and by far the tallest structure in North Korea. Kim is approximately 5'3", weighs 192 pounds, and his shadow is 7.5 ft. Illustrate the diagram. Determine how far Kim Jong Un stands from the building so that his shadow coincides with the Hotel's shadow. Identify the means and extremes of the proportion. Explain your reasoning. **(MA.912.D.1.2; MA.912.G.2.4; MA.912.G.4.1; MA.912.G.4.5;)**
16. Howe was naturally concerned pupils had memorized material they often did not understand. Those who could repeat lines from the poem "Thanatopis" could not define the word in the title. William Cullen Bryant's "Thanatopis" it often interpreted as a peaceful vision of death as a natural phase in returning to nature: *"Earth, that nourished thee, shall claim Thy growth, to be resolved to earth again."* Emotionally inspired by this poetic masterpiece, you elect to pay homage to the late author. Upon entry of Bryant Park in midtown Manhattan, you observe a *"seated figure with intrgral plinth on a pedestal under an archiform canopy, with a large urn and a balustrade at either side"* (City of New York Parks and Recreation). You want to approximate the height of the monument. In absence of appropriate judgment, a rope is strategically affixed to the pinnacle of Bryant's head and fully extended in a diagonal fashion approximately 10 feet. An additional rope is attached to a stake at the base of the statue, which extends 8 feet forming vertex with the diagonal. Using the Pythagorean Theorem, find the height of the monument of the right triangle and determine if a Pythagorean Triple exists. Identify the formulas as well as specifically what information one may derive from obtaining the following measurements via the following trigonometric ratios when applied to the sculpture: tangent, sine, and cosine. Explain your reasoning and determine whether the solution(s) is reasonable in the context of the original situation. (**MA.912.G.5.1; MA.912.G.5.4; MA.912.T.2.1)**
17. An academically elite northeastern educational institution of higher learning administration building possesses an immaculate marble floor meticulously designed in the shape of a regular dodecagon. Find the reciprocal of the absolute value difference between the measure of an interior angle and an exterior angle. Illustrate the polygon as well as all of its diagonals. (**MA.912.G.2.2; MA.912.G.2.5; MA.912.G.8.6)**
18. In 1980, the Continental Baking Corporation produced a 10-foot, 1.3-ton behemoth to celebrate Twinkie's 50th Birthday. A standard however, Twinkie possesses the following dimensions: 1.1 by 3.9 by 1.5 inches. Illustrate the time-honored Twinkie to scale. Remove the circular portion creating a two-dimensional figure. Identify and define the following pertinent geometric components: *chord, radius, diameter, secant, tangent, point of tangency,* and *center*. Illustrate a series of recently decapitated Twinkies and identify *tangent* and *concentric circles*.
(**MA.912.G.1.2; MA.912.G.6.2; MA.912.G.6.4; MA.912.G.6.5; MA.912.G.7.4)**

19. In the best interest of ensuring a safe and secure educational environment conducive to student learning, school officials are targeting the specific location in which an intense food fight occurred in the cafeteria. Local law enforcement wants to arrest multiple students for inciting a riot; however, administrators have determined this situation will be rectified internally in absence of legal intervention. Naturally, they contract the intellectual services of the mathematics department who meticulously analyzed film, disaggregated data, and reconstructed the cafeteria into a coordinate plane. The following readings were rendered: circle A center (-2, 2.5) and 7 feet away; circle B center (4, 6) 4 feet away; circle C (3, -2.5) 5 feet away. Write the standard equation of each circle. Graph the circles and identify the intersection of all three circles. **(MA.912.G.1.2; MA.912.G.6.6; MA.912.G.7.7)**
20. An architect is a person trained and licensed to plan, design, and oversee the construction of buildings. To practice architecture means to provide services in connection with the design and construction of buildings and the space within the site surrounding the buildings, that have as their principal purpose human occupancy or use. The Online Etymologically Dictionary suggests the term, architect derives from the Latin architectus, which derives from the Greek arkhitekton (arkhi-, chief + tekton, builder), i.e., chief builder. Angle Nonagon Pythagoras possesses a deep-seated passion for mathematics and serves as an architect tasked with designing a replica hockey stadium comparable to the massive Gadaffi in Lahore, Pakistan. Angle is creating a custom window frame in the shape of a regular hexagon. To aid in evaluating costs of materials, he wants to find the area of the hexagon to determine the amount of glass required. Angle meticulously measured diagonal *d* and concluded it equates to 40 inches. In light of recent acts of terrorism employed at the Boston Marathon, he has elected to outfit the facility in bullet-resistant glass valued at approximately $5.50 per square inch. Angle will require 25 rows of 25 windows across the perimeter of the facility. Determine the overall cost of glass alone affiliated with the industrial-strength NASA-engineered material. **(MA.912.G.2.5)**
21.

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Extra Credit

1. The infamous Atlanta Public Schools Testing Scandal criminal investigation lasted approximately twenty-one months whereas the initial tumultuous allegations went back as many as six years. Thirty-four educators were charged of which four high-level administrators and six principals represented the senior staff members outlined in the indictment. Define a variable for the senior administrators and another for principals. Write the equation in slope-intercept form. Identify the slope and y-intercept. Transform the equation to standard form. Design a table, which includes a domain, range, and function rule. Graph the results. Identify the rate of change and the type of correlation present. Is the equation a direct variation? Find the constant of the variation. Identify the domain and range of each relation. Identify the dependent and independent variables. Create a mapping diagram, and determine whether a function exists via the Vertical-Line Test. **(MA.912.A.3.7 – MA.912.A.3.13; MA.912.A.1.4; MA.912.A.2.13; MA.912.A.2.2 - MA.912.A.2.4)**
2. During the aforementioned Atlanta Public Schools Testing Scandal, a senior administrator discreetly confessed fault to allegations of cheating to a trusted colleague. After one minute elapses, temptation assumes control and his confidant discreetly shares this highly confidential information with another. Every minute thereafter, every employee familiar with the confession enlightens another not limited to but to include the one who initially disseminated it. In a room of 30 people, the expression $30/1 + 29 \times 2^{-t}$ predicts the approximate number of people who will have heard the verdict after *t* minutes. About how many people will have heard the verdict after 2 minutes, 5 minutes, and 10 minutes? **(MA.912.A.10.1; MA.912.A.10.3; MA.912.A.3.5; MA.912.A.4.1)**
3. In protest of the tragic unforeseeable demise of the beloved Twinkie, a disgruntled lifelong consumer of treasured Hostess products ceremoniously sacrifices the self-proclaimed final Twinkie in existence. He boldly scales the Sunshine Skyway Bridge and reaches the pinnacle of precisely 431 feet. Upon releasing the defenseless Twinkie, the force of the gravity causes the product to fall rapidly into the bay. The function *h* is equivalent to negative sixteen squared increased by 431 reveals the height of the Twinkie *h* in feet after *t* seconds. Height *h* is dependent on time *t*. Graph *t* on the x-axis and *h* on the y-axis. Use nonnegative values for *t*. Illustrate the table and graph this quadratic equation. Does the Twinkie fall as far from $t = 1$ to $t = 2$ as it does from $t = 0$ and $t = 1$? Explain. Identify the *axis of symmetry, vertex, parabola, minimum,* and *maximum*.
(MA.912.A.10.1; MA.912.A.7.1; MA.912.A.7.2; MA.912.A.7.10; MA.912.A.7.8)
4. In compliance with longstanding Florida state law articulated above, a public school administrator has decided to employ corporal punishment upon a 10-year-old child who has blatantly elected not to adhere to policies and procedures as articulated in the student handbook. The school official passionately swings the paddle upward with a starting velocity of 2 feet per second from an initial height of 4 feet. Without taking into consideration wind resistance or related applicable factors, assuming the paddle travels uninterrupted, how long will it remain in the air? Explain your reasoning via employing the vertical motion formula $h = -16t^2 + vt + c$. **(MA.912.A.10.1; MA.912.A.7.2; MA.912.A.7.8)**

Above and beyond the traditional holiday season of giving, we at The Daughtry Times have found it feels good to give and have taken an intellectual investment in the local populace via the frequent dissemination of a product ultimately inherent to student learning. Provided the conclusion of the traditional academic school year, we have initiated a temporary moratorium; however, shall reconvene in the near future. We hope that you have enjoyed your semi-annual subscription and strongly encourage you to visit us online at daughtrytimes.com. That is all.