GEOMETRY COMPREHENSIVE MIDTERM EXAMINATION

CPT DAUGHTRY   **FRIDAY, OCTOBER 18, 2013**

1. Joseph E. Darlak previously served as Captain of the USS Vandegrift at least until a rowdy and booze-fueled port visit to Vladivostok, Russia. Assume for a moment he commanded the neighboring vessels at sea in a manner comparable to the game of chess where six different kinds of pieces are translated in accordance to rather unique rules. The Knight is only authorized to move in an "L" shape similar to a right angle. It moves two spaces horizontally or vertically and the one additional square perpendicular to its original direction and it captures the vessel it lands on or infiltrates. Illustrate a diagram and use coordinate notation to describe two translations a knight may employ to capture a neighboring vessel. Explain why the term congruence transformation is used in describing translations, reflections, and rotations. Explain your reasoning in determining whether a point or line be its own image under a transformation? **(MA.912.G.1.2; MA.912.G.2.2; MA.912.G.2.3; MA.912.G.2.4)**

2. Peter Edward Rose was actively employed in Major League Baseball as a player from 1963 – 1986 and a manager from 1984 – 1989. He is the all-time leader in hits yet he was suspended indefinitely from baseball for gambling which commissioner Bud Selig has since upheld. 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)**

3. 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)

4. Provided the information illustrated on a coordinate graph from question three, identify scalene, isosceles, and equilateral triangles and classify each by angle. Create three congruent triangles utilizing the Third Angeles or Hypotenuse-Leg Congruence Theorems, Side-Side-Side and Side- Angle-Side Congruence Postulates to support your reasoning. **(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)**

5. 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)

6. In America, the U.S. Treasury Department's Bureau of Engraving and Printing is charged with designing and manufacturing paper bills. 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)

THAT IS ALL.

7. In light of a recent series of unforeseeable events not limited to but to include an imminent government shutdown, 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 personal domain. Multiple legitimate agencies are available; however, two somewhat legal financial organizations have presented somewhat appealing offers one simply cannot refuse. 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 financial services? Graph the results. Explain your reasoning. **(MA.912.G.8.2; MA.912.G.8.3)**

8. 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)**

9. President Obama serves as Commander-In-Chief or the person 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. A segment that joins two nonconsecutive vertices of a polygon is called a diagonal. How many diagonals exist in a pentagon? **(MA.912.G.2.3; MA.912.G.2.5; MA.912.G.8.2; MA.912.G.8.6)**

10. AT&T Inc. is an American multinational telecommunications corporation headquartered in Whitacre Tower, downtown Dallas, Texas. AT&T is the largest provider both of mobile telephony and of fixed telephony in the United States, and also provides broadband subscription television services (The Dallas Morning News, 2008). Interestingly enough, Verizon was founded in 1983 as Bell Atlantic Corporation as one of the "Baby Bells" that were formed because of the anti-trust judgment against the American Telephone & Telegraph Company and adopted the name "Verizon", a portmanteau of veritas which is Latin for "truth"and horizon (Verizon Company Profile). Verizon headquarters is located in Manhattan, New York or approximately 1554 miles northeast of AT&T. Provide and plot the two points (x1, y1) and (x2, y2), necessary to render the appropriate distance between these points. Solve provided by the applicable Distance Formula. Illustrate a coordinate plane. Apply the Midpoint Formula and confirm the location on the map. Determine whether a solution is reasonable in the context of the original situation. **(MA.912.G.8.2; MA.912.G.8.3; MA.912.G.8.6; MA.912.G.1.1)**

11. USA Today suggests Snowden has been offered asylum by three Latin American countries — Venezuela, Bolivia and Nicaragua — but has been unable to travel since the U.S. revoked his passport and charged him under the Espionage Act for leaking information to reporters about the NSA's worldwide surveillance and data-gathering networks. Nicaragua is located approximately 2498 miles northwest of Bolivia. Venezuela is located about sixteen twenty-fifths of the total distance. Illustrate a sketch accurately representing 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 Nicaragua to Venezuela. Is the solution reasonable in the context of the original situation? **(MA.912.G.8.2; MA.912.G.8.3; MA.912.G.1.1)**

THAT IS ALL.