

In the midst of a legendary confidential clandestine Navy SEALs operation, positions were strategically outlined in the war room in advance. The late Chief Petty Officer Chris Kyle was discreetly located at (8,4), as portrayed by Mark Wahlberg in the recently released *Lone Survivor*, Petty Officer First Class Marcus Luttrell at (18,7) and the posthumously awarded Medal of Honor recipient, Lieutenant Michael P. Murphy, (24,14). Kyle tosses necessary ammunition to Luttrell, who projects it to Murphy. How far did Kyle throw the can of ammunition? How much less or farther was the throw by Luttrell? Assuming Kyle threw directly to Murphy thereby bypassing Luttrell, how far much further would it have traveled? Identify the midpoint of each segment. 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)

SEAL Team Three, Delta Platoon was sent to Iraq in April 2006 and assigned to train Iraqi Army soldiers in Ramadi. Over the next five months, Monsoor and his platoon frequently engaged in combat with insurgent forces. On September 29, 2006 an insurgent threw a grenade onto a rooftop where Monsoor and several other SEAL and Iraqi soldiers were positioned. Monsoor quickly smothered the grenade with his body, absorbing the resulting explosion and saving his comrades from serious injury or death. Monsoor died about 30 minutes later from serious wounds caused by the grenade explosion. Assume for a moment that Monsoor and his associates were located 15 feet from the insurgent responsible for throwing the explosive detonation device. Two of the warriors were 24 feet from each other adjacent to the boundaries of the training site. Employ the Perpendicular Bisector Theorem, its converse and concurrency of Perpendicular Bisectors of a Triangle to determine how far the insurgent was located from the training site boundary. 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)**

On April 14, 2004, 3 days after Easter Sunday, Corporal Dunham was manning a checkpoint in Karabilah, Iraq, when an insurgent leapt from his car and began choking Corporal Dunham. A scuffle ensued as two Marines approached to help. Reportedly, the last words from Corporal Dunham were, "No, No. Watch his hand." Suddenly, the insurgent dropped a grenade. Corporal Dunham took off his Kevlar helmet, dropped to the ground, and covered the explosive as best he could. The blast seriously wounded all 3 Marines. Eight days later, Corporal Jason L. Dunham died at Bethesda Naval Hospital from wounds he received in the incident. He was 22. Assume for a moment Corporal Dunham previously monitored the insurgents' mannerisms and patterns of movement 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 then one additional square perpendicular to its original direction where it intersects with the aforementioned insurgent. Illustrate a diagram and use coordinate notation to describe two translations a knight may employ to initiate contact with an insurgent. 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)**

Alliances of former Vietnam Prisoners of War frequently attend memorials designated for deceased American service members. One of their primary objectives is to ensure the honor and integrity of deceased military member(s) and their families in the likely event of riots or protests in the neighboring areas. A critical task is to serve as a *lookout*. During a commemorative speech in honor of a fallen warrior, 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)**

In an attempt to ultimately minimize U.S. casualties sustained in combat comparable to the tragic demise of the beloved Wise brothers, the Department of Defense has wisely established a superior defensive resource – The indestructible DAUGHTRY2K14 – an industrial strength geometry disseminating tactical urban assault robot to methodically navigate behind enemy lines. Each industrial strength reinforced steel leg is constructed with pair of parallel bars coupled with a necessary 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)**

The aforementioned *lookouts* operate discreetly in a triangular configuration to maximize the effectiveness of their rather intimidating yet often time necessary presence. Determine the measurements of each interior angle provided one of which equates to 70 degrees. Incorporate an auxiliary line to determine the measure of an exterior angle ($2x - 5$)? Illustrate and classify the design by its sides and its angle measurements. Write a congruence statement and 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)**

As detected via an aerial news helicopter covering a military burial, the *lookouts* were identified at the following coordinates: $A(-3,0)$, $B(0,4)$, $C(3,0)$. Illustrate the triangle provided the vertices, classify by its sides, and determine if it is a right triangle. Explain 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)**

A HMMWV and a Buffalo Mine Protected Vehicle discreetly depart the Forward Operating Base simultaneously in opposing directions of travel infiltrating deep behind enemy lines. Each vehicle travels two miles, then changes directions and proceeds an additional 2.4 miles. The HMMWV starts due east and suddenly turns 50 degrees north. The BMPV initiates travel due west and turns 45 degrees south. Construct a diagram illustrating these results, identify which vehicle has progressed farthest from camp, 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)**

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 aforementioned sequestration. **(MA.912.G.8.2; MA.912.G.8.4; MA.912.G.8.4)**

Operation Iraqi Freedom refers to military operations in Iraq that began March 19, 2003 and officially ended August 31, 2010. Operation Enduring Freedom refers to combat operations in Afghanistan and other regions in support of the Global War on Terror. Kabul, Afghanistan is located approximately 1791 miles east of Baghdad, Iraq. Tehran, Iran is located about 70 percent of the total distance from Kabul. 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 Baghdad and Tehran. 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)**

A conjecture is an unproven statement that is based merely on observations. Inductive reasoning uses specific examples and patterns to form a conjecture. You can show that a conjecture is false, however, by simply identifying one counterexample. Make and test a conjecture based solely upon numbers identified in the passage above. Identify a counterexample. Based solely upon the aforementioned information, create a conditional statement or a logical statement, which contains a hypothesis and conclusion in if-then form, the converse, the inverse, and the contrapositive. Write as a biconditional statement. Rewrite each conditional statement using *symbolic notation*, where letters are used to represent numbers. Decide whether each statement is true or false via organizing information into a truth table. Explain your reasoning. **(MA.912.D.6.2; MA.912.G.8.2; MA.912.G.8.4)**

October 1993 - Mogadishu, Somalia. The late heroic Sergeant Casey Joyce served as a US Army Ranger Team Leader. While embedded behind enemy lines at the infamous Bakaara Market, he detected multiple blatant obstructions such as inoperative household appliances located halfway between a series of wrecked cars and war torn apartment buildings. The apartments are located halfway between the wrecked cars and the coast of Somalia. Prove the distance between the wrecked cars and the appliances are the same as the distance between the apartments and the coast of Somalia. **(MA.912.G.4.5; MA.912.G.1.2; MA.912.G.8.2; MA.912.G.8.5; MA.912.G.8.6)**

An excerpt of the Ranger Creeds states, "Readily will I display the intestinal fortitude required to fight on to the Ranger objective and complete the mission, though I be the lone survivor." Articulate these words into 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)**

It has become increasingly evident to ensure a safe and orderly mass exodus of noncombatant civilian personnel, two additional intersecting evacuation routes must be established adjacent to the Watapur Valley, one parallel to the existing road and the other perpendicular. The equation of the line representing the existing road is $y = 1/2x - 1/3$. Identify the equations of the lines representing the new roads. Write the equation in slope-intercept form. Identify the slope and y-intercept. Transform the equation to standard form. Graph your results. **(MA.912.G.8.2; MA.912.G.8.3)**

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)**