

**JAMES ROUND 14  
TOSSUPS**

1. When this quantity changes, the substitution effect occurs. A consumption increase paradoxically accompanies a rise in this quantity for Giffen goods. This quantity is combined with opportunity cost to form the marginal cost of purchase. A deadweight loss occurs when this quantity is above or below equilibrium, and its namesake (\*) discrimination occurs when it is not equal for all consumers. The CPI is a measurement of 300 or so of these values which can be found at equilibrium by the intersection of the supply and demand curves. For 10 points, name this value which rises during inflation, the amount of money a buyer pays a seller for a good.

ANSWER: prices

2. This nation contains the city of Pula, which lies at the tip of the Istria peninsula, whose capital is Pazin. Nearby to Istria is this country's principal seaport, the city of Rijeka. This country also contains the coastal region of Dalmatia, which, along with Pula and Rijeka, lies on the (\*) Adriatic Sea. This country contains the western part of Slavonia, whose largest city in this country is Osijek, located on the Drava River. The highest point of this country is Dinara, located in an extension of the Alps. For 10 points, name this NATO member country that surrounds Bosnia and Herzegovina on two sides and has its capital at Zagreb.

ANSWER: Republic of Croatia

3. This man wrote an expressionist play about an brutish ocean liner worker who experiences an identity crisis, while his best known comedy sees Richard's mother worry about him reading subversive books. This author of *Ah, Wilderness!* and *The Hairy Ape* wrote a trilogy of plays set in the Civil War based on the (\*) Oresteia named *Mourning Becomes Electra*. This playwright wrote a play in which a group of people muse on their pipe dreams and await the salesman Hickman in Harry Hope's bar. In another play, tuberculosis and a morphine addiction threaten members of the Tyrone family. For 10 points, who wrote *The Iceman Cometh* and *Long Day's Journey into Night*?

ANSWER: Eugene O'Neill

4. This battle opened when the jester Taillefer attacked a soldier while reciting the Song of Roland. After this battle, victorious troops were ambushed in the Malfosse. One side in this battle employed housecarls and effectively used a shield wall to defend against archer attacks. This battle took place after Tostig's brother defeated a Viking invasion at (\*) Stamford Bridge that was led by Harold Hardrada. This battle occurred at Senlac Hill, where its loser was shot in the eye. The Bayeux Tapestry depicts Harold Godwinson's loss at this battle. For 10 points, name this 1066 victory for William the Conqueror.

ANSWER: Battle of Hastings

5. The oldest known specimen belonging to this plant clade is *Archaeofructus lianongensis*, and the male and female gametophytes of this plant clade are greatly reduced, having only three and seven cells, respectively. This group of organisms is characterized by the presence of a 3n (\*) endosperm in the fertilized seed, and following fertilization in these plants, a pericarp forms. These organisms have micropyles through which double fertilization occurs. This clade includes monocots and dicots, and plants in this clade notably have carpels and stamens. Fruits are formed from flowers in, for 10 points, what group of flowering plants contrasted with gymnosperms?

ANSWER: angiosperms

6. The book *Collision 2012* notes how Henry Kissinger said "Your country needs you" to this man, telling him to run for president. After this man accused Rand Paul of "pork barrel spending," Paul called this man the "king of bacon." After the death of Senator Frank Lautenberg, this man was criticized for announcing an extra special election in mid-October; (\*) Cory Booker won that election. This politician was criticized by Republicans for praising President Obama's response to a certain disaster. In February 2013, this man underwent lap-band stomach surgery. For 10 points, what man had to handle Hurricane Sandy as governor of New Jersey?

ANSWER: Chris Christie

7. This civilization may have been the descendant of the mythical Xia dynasty, based on a similarity in facial features found in masks, which this civilization was known for carving in jade. Motifs in this civilization's art include the elongated man and were-jaguars. A major center of this civilization was uncovered at San

**Lorenzo, while another is at (\*) La Venta. This civilization was argued by Matthew Stirling to be the first based in Mesoamerica. The most famous relics of this civilization were made from basalt and weigh several tons. For 10 points, name this civilization best known for its statues of gigantic heads.**

ANSWER: Olmecs

**8. In the cumene process, this is done to cumene in order to form cumene hydroperoxide. Georg Stahl first proposed the phlogiston theory of this process. The maximum efficiency of a common machine that uses this process can be attained by the Carnot cycle. Surpassing the (\*) flash point will allow this type of oxidation reaction to occur, while surpassing the autoignition temperature will cause it to occur spontaneously. In the complete form of these reactions, oxygen reacts with a hydrocarbon to produce carbon dioxide and water. For 10 points, name these reactions which can be simply described as blowing things up.**

ANSWER: combustion reactions (prompt on "oxidation" before it is read)

**9. In one play by this writer, a supposed orphan is reunited with his mother after she recognizes a basket he has. This playwright of *Ion* wrote two plays about a woman nearly sacrificed to allow her father's troops to set sail; those plays are about Iphigenia. The infant Astyanax is killed in one of his plays in which the title characters are variously captured and made to (\*) suffer by the Greeks; those characters include Andromache and Hecuba. In another of his plays, the title woman kills Glaucus with a poisoned robe after Jason abandons her. For 10 points, name this Ancient Greek tragedian who wrote *The Trojan Women* and *Medea*.**

ANSWER: Euripides

**10. A rake lies at the bottom of this work, and a fluffy white dog to the right of it peeks over a bridge. Gabriel Doyen was initially asked to paint this work's subject, but refused and passed on the commission. A stone cupid observes to the left of the central figure in this painting, while two more cupids observe from the right. The central figure's lover (\*) hides in the bushes at the bottom of this painting and gazes lewdly as her husband pushes the title device unawares. For 10 points, Jean-Honore Fragonard painted a girl with a billowing pink dress kicking her shoe off while riding the titular device in what masterpiece of the Rococo style?**

ANSWER: The Swing

**11. This man was baptized by Ananias of Damascus, and in one of his writings he says to "put on the full armor of God" to guard against the Devil. This man traveled extensively with Barnabas, and he wrote one well-known work with (\*) "Timothy our brother." In that work, he notes that without love, he is like a "noisy gong" or a "crashing cymbal." This author of Ephesians and 1 Corinthians was responsible for holding the coats of those who stoned Saint Stephen. This man converted to Christianity after he was struck blind by God on the road to Damascus. For 10 points, name this biblical figure previously named Saul who wrote many epistles.**

ANSWER: Paul [accept Saul before it is mentioned]

**12. This president was shot by Charles Dickinson and vetoed a bill that would have constructed a road through Kentucky known as the Maysville Road. Richard Lawrence attempted to assassinate this man, whose wife Rachel Donelson died shortly after one election. This man's first Secretary of State resigned in order to end the (\*) Peggy Eaton Affair. This president and Nicholas Biddle fought the "Bank war" over the renewal of second Bank of the United States' charter. John Quincy Adams supposedly beat this man in the 1824 election as the result of a "Corrupt Bargain." For 10 points, what seventh President of the United States was known as "Old Hickory"?**

ANSWER: Andrew Jackson

**13. One leader of this country contracted Brown and Root to construct the world's largest underground network of pipes in order to create the "Great Manmade River" to irrigate this country. This nation's capital city was bombed by the United States in response for its alleged support of the 1986 Berlin nightclub attack. Two citizens of this country were tried for planning the (\*) Lockerbie bombing. In 2011, rebels in this country stormed Green Square and started a National Transitional Council. A leader of this country was killed in Sirte after the fall of Benghazi. For 10 points, name this North African nation formerly led by Muammar al-Gaddafi in Tripoli.**

ANSWER: State of Libya [accept Libyan Arab Jamahiriya]

**14. The presence of this element's degenerate type leads to its namesake flash. This element with more than one valence electron was produced during the nucleosynthesis after the Big Bang. The CNO cycle is used to**

**produce this element, which is consumed in red giants during the triple-alpha process. It was first discovered as a (\*) yellow spectral line during a solar eclipse in 1868. This element has a 25% abundance in the universe, and its nucleus is equivalent to an alpha particle. Within most stars, it is created by the nuclear fusion of hydrogen atoms, which it has double the protons of. For 10 points, name this element, the lightest noble gas, with atomic symbol He.**  
ANSWER: helium (prompt on "He" before read)

**15. One name for this goddess stems from her birthplace near the lake Tritonis. This goddess gave a box to the three daughters of Cecrops which contained the offspring of Hephaestus's failed attempts to rape this figure. In contrast to Poseidon's gift of a salt spring, this goddess gifted an (\*) olive tree to a city desiring a name. This daughter of Metis sprung fully formed from another god's head, and had the epithets "Pallas" and "gray-eyed." She lost a weaving contest to Arachne, whom she turned into a spider. For 10 points, name this daughter of Zeus, a Greek goddess of wisdom who is equivalent to Minerva in Roman mythology.**  
ANSWER: Athena (accept any given name before mention)

**16. The final of this composer's seven symphonies is a one movement piece titled a "Fantasia sinfonica." One of this man's works was part of incidental music for his brother-in-law's play and was literally titled "Sad Waltz." This composer of *Valse Triste* titled one of his works (\*) "Impromptu," and he used an English horn to depict a scene from the underworld with the title waterfowl mournfully swimming in his *The Swan of Tuonela*. This composer included pieces based off the *Kalevala* in the *Lemminkäinen Suite*. This man composed a piece protesting Russian censorship of his homeland. For 10 points, name this composer of the patriotic *Finlandia*.**  
ANSWER: Jean Sibelius

**17. George Chapman finished this writer's poem about a lover who nearly drowns swimming across the Hellespont titled "Hero and Leander." In a play by this man, the title character burns a copy of the Qu'ran after conquering Babylon and becoming emperor of Persia. The most famous play by this writer of (\*) *Tamburlaine* sees one character poison his daughter Abigail and opens with a parody of Machiavelli. In that play, the title character alternately betrays the Christians and the Turks before falling in a boiling cauldron. The merchant Barrabas is the title character of, for 10 points, what playwright's *The Jew of Malta*?**  
ANSWER: Christopher Marlowe

**18. This movement emerged after an "Anonymous Society" organized an independent exhibition after being rejected from the Salon. *The Child's Bath* was a painting by an American member of this art movement, Mary Cassatt. One member of this school painted the Houses of Parliament under varying (\*) weather conditions and another painted Van Gogh leaning over a boat rail in *The Luncheon of the Boating Party*. This school received its name from a painting of a sunrise over Le Havre harbor, and one artist from this school painted haystacks and water lilies. For 10 points, Auguste Renoir and Claude Monet were of what school of art?**  
ANSWER: Impressionism (accept word forms)

**19. This man used an experiment containing a charged metal ball, insulating thread, and an ice-pail to confirm Gauss's law. Liquids may contain this man's namesake ripples, and alongside Joseph Henry, this man discovered that moving a magnet near a conducting loop can cause a current in the loop. The creator of a (\*) direct-current generator that produces an emf constant in time, this man names a device that causes the total electric field at every point inside it to be zero; that is his namesake "cage." For 10 points, name this man with a namesake law of induction and whom the SI unit of capacitance is named after.**  
ANSWER: Michael Faraday

**20. One of this writer's stories describes a cancer victim who wears cellophane goggles and is titled "Teach Us To Outgrow Our Madness." In another of his novels, the Korean Li teaches a group of boys to hunt birds. Those boys are abandoned by a village after the onset of a plague in this man's novel (\*) *Nip the Buds, Shoot the Kids*. In his other novels, Mitsusaburo's friend hangs himself after sodomizing himself with a cucumber, while in another, Bird's son is born with a brain hernia. For 10 points, name this Japanese author of *The Silent Cry* whose novels like *A Personal Matter* are frequently inspired by his own mentally retarded son.**  
ANSWER: Kenzaburō Ōe

**TIEBREAKER/REPLACEMENT TOSSUPS**

21. In one work by this author, Leo abandons the members of the League, who include Paul Klee and Plato; that work is *Journey to the East*. Pistorius teaches Emil Sinclair in this author's *Demian*, while a work set in Castalia sees Joseph Knecht occupy the position of (\*) Magister Ludi. Along with *The Glass Bead Game*, he wrote a work about a friend of Govinda who learns enlightenment from a ferryman and in another a visit to the Magic Theater follows Harry Haller's identification with the title man-beast. What German author, for 10 points, wrote the self-discovery themed works *Siddhartha* and *Steppenwolf*?

ANSWER: Hermann Hesse

22. Bulb-like lobes are evident in this entity's Malaspina example, which is one of the Piedmont types of this body. The absence of these bodies leads to isostatic rebound after initial crust subsidence. Holes known as moulins may occur in these bodies, and elongated hills called (\*) drumlins can be formed by these bodies. Ablation zones are regions where these bodies lose mass, and the tracks of debris they leave behind are called moraines. The majority of the world's fresh water is contained in these bodies, examples of which include ice sheets. Icebergs break off of, for 10 points, what large moving masses of ice?

ANSWER: glaciers (prompt on "ice sheet" before it is read)

## BONUSES

1. For 10 points each, answer some questions about the history of Brazil:

[10] Brazil was colonized by this country, after it sponsored the exploration of Pedro Alvares Cabral.

ANSWER: Portugal or Portugese Republic

[10] This was the name of the only two emperors of Brazil, the first of who founded the empire after obtaining independence from Portugal and abolished slavery with the Golden Law.

ANSWER: Dom Pedro

[10] This President of Brazil nicknamed "The Father of the Poor" established the Estado Novo.

ANSWER: Getulio Vargas

2. There are three of these units in the word "bats" -- "b," "a," and "ts." For 10 points each:

[10] Name these linguistic units who map to a single meaningful sound. They may combine to form morphemes and are often represented by single letters.

ANSWER: phonemes

[10] These pairs of words differ in only one phoneme, like "bat" and "pat" in English. They may be used to distinguish between phonemes that are different and allophones.

ANSWER: minimal pairs

[10] English has an alphabet, meaning each letter represents a phoneme. In contrast, these writing systems use pictures to represent words or morphemes. Ancient Egyptian is a notable example.

ANSWER: hieroglyphics

3. Going around this point means traversing the Drake Passage; two shortcuts are the Beagle Channel and the better known Strait of Magellan. For 10 points each:

[10] Name this cape, the southern most point of South America.

ANSWER: Cape Horn

[10] Cape Horn lies on this archipelago shared between Argentina and Chile. Its name in Spanish literally means "land of fire."

ANSWER: Tierra del Fuego

[10] This region of southern South America is home to cities like Punta Arenas, Ushuaia, and Puerto Williams.

ANSWER: Patagonia

4. There are carbon-13 and 2D COSY variations of this laboratory technique. For 10 points each:

[10] In what technique are characteristic chemical shifts used to determine the structure of a molecule?

ANSWER: nuclear magnetic resonance spectroscopy [accept NMR spectroscopy]

[10] The most common form of NMR is used with reference to this particle, one of which is found in the nucleus of the 1-hydrogen isotope.

ANSWER: proton

[10] This chemical abbreviated TMS was historically used as a reference for shifts. Most machines can now use the solvent itself as a reference.

ANSWER: tetramethylsilane

5. Zadie Smith based her novel *On Beauty* on this novel. For 10 points each:

[10] Name this book about the Wilcox, Schlegel, and Bast families which opens with the epigraph "Only connect."

ANSWER: Howards End

[10] *Howards End* is a book by this British novelist, who described the romance of George Emerson and Lucy Honeychurch in *A Room with a View*.

ANSWER: Edward Morgan Forster

[10] One Forster novel is titled "a Passage" to this country. Salman Rushdie is a writer of descent from this country who set *Midnight's Children* here during its independence from Britain.

ANSWER: Republic of India

6. One member of this movement, John Everett Millais, caused scandal with his painting of *Christ in the House of His Parents*. For 10 points each:

[10] Name this "Brotherhood" of English artists who rejected the Classical influence of a certain Renaissance painter on art.

ANSWER: **Pre-Raphaelite** Brotherhood

[10] This man was a leading founder of the Pre-Raphaelites. He showed a red dove next to the light-enveloped title woman in *Beata Beatrix*, and his sister Christina was known for her poem "Goblin Market."

ANSWER: Dante Gabriel **Rossetti**

[10] *Beata Beatrix* was portrait of Beatrice, the love of this Italian poet. He is best known for his cycle consisting of the Inferno, Purgatorio, and Paradiso, the Divine Comedy.

ANSWER: **Dante Alighieri** (accept either or both names)

7. This show stars Kevin Spacey as House Majority Whip Frank Underwood. For 10 points each:

[10] Name this online series focusing on the efforts of Underwood to undermine the government after getting denied for Secretary of State.

ANSWER: **House of Cards**

[10] *House of Cards* airs exclusively on this online streaming site, that controversially split its rental and streaming services.

ANSWER: **netflix.com**

[10] *House of Cards* was produced for Netflix by this director of *The Social Network* and *Se7en*. He also directed a movie about soap salesman Tyler Durden, *Fight Club*.

ANSWER: David **Fincher**

8. When this process occurs through a pinhole, Graham's Law relates its speed for gases of different molar masses. For 10 points each:

[10] Name this process in which an initially concentrated entity spreads out. For water, it is called osmosis.

ANSWER: **diffusion**

[10] Diffusion may be simply modelled by this random movement of particles, as exemplified by pollen grains in water.

ANSWER: **Brownian motion**

[10] The first of these two laws describing diffusion states that the diffusion flux is equal to the negative diffusion coefficient times the derivative of the concentration with respect to position.

ANSWER: **Fick's** laws of diffusion

9. For 10 points each, answer some questions about the influence of religion on American politics:

[10] This former Governor of New York lost the 1928 US Presidential Election in a dirty campaign that used this man's Catholicism to attack him.

ANSWER: Alfred "Al" **Smith**

[10] This man won an election after a preacher associated with his opponent, James Blaine, declared the Democratic Party the party of "rum, Romanism, and rebellion." He served two non-consecutive terms as president.

ANSWER: Grover **Cleveland**

[10] Peter Stark is the only member of Congress to openly adhere to this belief system. In 2007 he claimed that as a "Unitarian" he adheres to this belief system.

ANSWER: **atheism**

10. The author of this work sees his mother and his sister, Tzipora, for the last time upon entering a Auschwitz-Birkenau. For 10 points each:

[10] Name this Elie Wiesel book about the Holocaust, with sequels *Dawn* and *Day*.

ANSWER: **Night**

[10] Another famous work of Holocaust literature is the diary of this Amsterdam girl, published by her father Otto after her death.

ANSWER: Anne **Frank**

[10] This author wrote about his family's experience with the Holocaust in *Everything Is Illuminated*. He also wrote about Oskar Schell, whose father dies during 9/11, in *Extremely Loud and Incredibly Close*.

ANSWER: Jonathan Safran **Foer**

11. In times of crisis, American presidents have taken to giving speeches. For 10 points each:

[10] After the attack on this military base, Franklin Delano Roosevelt delivered an address calling for American entry into WWII. He described the day of attack, December 7, 1941, as "a date which will live in infamy."

ANSWER: **Pearl Harbor**

[10] During the energy crisis of the late 70's, Carter retreated to Camp David for 10 days and then delivered a speech known by this term. In it, he identified a "crisis of confidence" among the American people, but never used this word.

ANSWER: malaise [muh-LAYZ]

[10] During the Watergate scandal, Richard Nixon famously proclaimed that he was not one of these people, as he "earned everything" he had. According to Nixon, people had the right to know if their "President is" one of these people.

ANSWER: crook [do not accept alternate answers]

12. One person with this surname discovered both radon and polonium. For 10 points each:

[10] Give this surname of a mother, father, and daughter group who have all won Nobel Prizes for chemistry.

ANSWER: Curie (accept Marie, Pierre, or Irene Curie)

[10] The Curie is a unit measuring this process, which Marie and Pierre Curie won the Nobel Prize in Physics for. In this process, unstable nuclei emit particles and energy.

ANSWER: radioactivity (accept word forms)

[10] This is the SI unit of radioactivity, named after the person who shared the Nobel Prize with the Curies.

ANSWER: becquerel or Bq

13. In this work's Bhagavad Gita section, the prince Arjuna asks his charioteer Krishna for advice. For 10 points each:

[10] Name this Indian epic about the Kurukshetra War.

ANSWER: Mahabharata

[10] The Mahabharata was written in this ancient Indo-European language. Panini was an early grammarian in this language.

ANSWER: Sanskrit

[10] Arjuna is a member of the Pandavas, who wage war with this group of brothers. Duryodhana is the eldest among this group.

ANSWER: Kauravas

14. Pericles gave the Funeral Oration during this war. For 10 points each:

[10] Name this war which Athens and the Delian League fought against the rest of much of the namesake peninsula in Greece.

ANSWER: Peloponnesian War

[10] Athens's primary rival in the Peloponnesian War was this other Greek city-state known for its militaristic culture. Lysander was a general from this city.

ANSWER: Sparta

[10] The Peloponnesian War was ended with this battle in which Lysander crushed the naval fleet of Athens led by Conon. When the messenger ship the *Paralus* informed Athens of the defeat, a citywide panic occurred.

ANSWER: Battle of Aegospotami

15. Despite never having actually seen a live one, this artist's woodcut of a rhinoceros became popular throughout Europe. For 10 points each:

[10] Name this artist best known for his woodcuts and engravings, such as *Knight, Death and the Devil* and *Saint Jerome in his Study*.

ANSWER: Albrecht Dürer

[10] This enigmatic engraving by Dürer contains a 4 by 4 magic square along with a rhombohderon solid now named after him.

ANSWER: Melencolia I

[10] Another woodcut artist with a somewhat mathematical connection was this man, who made depictions of tessellations and paradoxical structures like a staircase looping on itself.

ANSWER: Maurits Cornelis Escher

16. The first section of this work is a rebuttal of Robert Filmer's *Patriarcha*. For 10 points each:

[10] Name this pair of works which argues that the title concept is formed by a contract between the people involved, who thus have the right to dissolve it when it acts against their interests.

ANSWER: Two Treatises of Government

[10] *Two Treatises of Government* is a work by this English philosopher who said that the human mind begins as a tabula rasa, or blank slate, in *An Essay Concerning Human Understanding*.

ANSWER: John **Locke**

[10] In the *Second Treatise*, Locke stated that government was formed to protect a right to this entity, which a person gains by infusing their own labor into it.

ANSWER: **property** (do not accept synonyms)

17. One disease affecting this class of organisms causes an often deadly thickening of the skin and is known as chytrid fungus. For 10 points each:

[10] Name this class of chordates which is generally known for a life cycle with terrestrial and aquatic phases.

Examples include frogs and salamanders.

ANSWER: **amphibians** (or **Amphibia**)

[10] This is the term for organisms like amphibians, fish, and reptiles that get most of their heat energy from their surroundings. During cold seasons, they can enter a state of torpor.

ANSWER: **ectotherms** (grudgingly accept **cold-blooded**; prompt on "poikilotherms")

[10] One member of the class Amphibia is the axolotl, a type of salamander that exhibits this characteristic, in which adults display traits that were formerly only seen in juveniles of the ancestral species.

ANSWER: **Paedomorphosis**

18. This novel begins with Phillip Marlowe being called to the mansion of General Sternwood. For 10 points each:

[10] Name this Raymond Chandler novel in which Marlowe finds out that Carmen killed Rusty, thus inducing the titular phenomena.

ANSWER: *The* **Big Sleep**

[10] This occupation of Phillip Marlowe is shared by Sam Spade in the Dashiell Hammet novel *The Maltese Falcon*.

ANSWER: **detective** (accept **private eye**, **private investigator**, or other reasonable equivalents)

[10] The Big Sleep takes place in this American city. Other novels set here include *The Day of the Locust* and *The Love of the Last Tycoon*.

ANSWER: **Los Angeles** or **LA**

19. This opera begins with the Spirit of 76' descending into Beijing. For 10 points each:

[10] Name this opera in which Chairman Mao dances the foxtrot and the title character sings "News Has A Kind of Mystery" after giving two V's for victory.

ANSWER: *Nixon in China*

[10] *Nixon in China* is a work of this composer, who also wrote the operas *The Death of Klinghoffer* and *Doctor Atomic*. His *On the Transmigration of Souls* commemorates the 9/11 attacks.

ANSWER: John **Adams**

[10] Along with Steve Reich, John Adams is a member of this artistic movement. It believes in using the the simplest or fewest elements to create the maximum effect.

ANSWER: **minimalism** (accept word forms)

20. This hero ensures that he would die standing upright by tying his intestines to a rock. For 10 points each:

[10] Name this mythical warrior who was taught by Scathach and fights in the Cattle Raid of Cooley against Queen Medb.

ANSWER: **Cú Chulainn** (prompt on "Sétanta")

[10] Cú Chulainn was the son of this deity known as "the long-handed". After the Cattle Raid of Cooley this god healed Cú Culainn over a period of three days.

ANSWER: **Lug**

[10] Cú Chulainn and Lug both possessed this kind of long shafted weapon, respectively called the Gae Bulg and the Gae Assal. One of these owned by Longinus was used to pierce the side of Christ.

ANSWER: **spear** (accept **lance**)

## **TIEBREAKER/REPLACEMENT BONUSES**

21. For 10 points each, name these concepts from fluid dynamics:

[10] This is the measure of a fluid's resistance to flow.

ANSWER: **viscosity**



[10] This set of doubly-eponymous equations describe the motion of fluids. They can be derived from applying Newton's second law to fluid motion.

ANSWER: **Navier-Stokes** Equations

[10] This number can be obtained by the non dimensional form of the Navier-Stokes Equations. It is the ratio of inertial forces to viscous forces.

ANSWER: **Reynolds** number

22. This western European nation has 27 regions including Alsace, Lorraine, and Corsica. For 10 points each:

[10] The Eiffel Tower is located in this country whose capital is located in a landlocked region named "island of this nation" when literally translated.

ANSWER: **France** (or **French** Republic)

[10] This peak, the highest in Europe outside of Russia, is located on the border of Rhone-Alpes and the Italian region of Aosta Valley.

ANSWER: Mont **Blanc** or Monte **Bianco**

[10] Only 22 of the 27 regions are located in France. Name this overseas region in South America, with capital Cayenne, that is home to the main launch site for the European Space Agency.

ANSWER: **French Guiana**