



1. **This man collected nearly all of his philosophy into his treatise *The World*, which he later incorporated into *The Principles of Philosophy*. He argued that the mind interacts with the body at the pineal gland, and he formulated a process for systematically (\*) doubting all beliefs to find which ones are true; that is called methodological skepticism, also known as his namesake doubt. For 10 points, name this French philosopher who in his Discourse on the Method declared "cogito ergo sum," or "I think, therefore I am."**

ANSWER: René Descartes

201-13-75-13101

2. **This country's TroTros are privately-owned minibuses acting as public transit. This country's Mole National Park is a refuge for elephants, and its landmarks include the Elmina slave castle and the hydroelectric Akosombo Dam, which forms Lake (\*) Volta. This home of the remaining Ashanti people is bordered to the east by Togo. For 10 points, name this African country, formerly called the Gold Coast, that built Kwame Nkrumah Memorial Park in its capital of Accra.**

ANSWER: Republic of Ghana

104-13-75-13102

3. **While this man was serving as foreign minister, the future racist theorist Joseph-Arthur Gobineau was his secretary. He noted the transition from one central power to another in *The Old Regime and the Revolution*. With Gustave de Beaumont, he was sent on a tour to investigate the (\*) American prison system but ended up writing a more wide-ranging work on localism and individualism in the US. For 10 points, name this French political scientist who authored *Democracy in America*.**

ANSWER: Alexis de Tocqueville

019-13-75-13103

4. **In one novel set in this country, David Lurie moves in with his daughter after being forced to resign his professorship for his relationship with a student. The author of that novel, (\*) *Disgrace*, is J. M. Coetzee. In another novel set in this country, a village priest learns his sister Gertrude has become a prostitute, and his son Absalom is executed for murdering Arthur Jarvis. For 10 points, name this home of Stephen Kumalo, the setting of *Cry, the Beloved Country*.**

ANSWER: Republic of South Africa

121-13-75-13104

5. **One representation of this data type stores them as a mantissa, or significand, and exponent. That representation is defined by the IEEE 754 standard. One measure of computing performance is the number of operations that can be performed with this data type per second. The Pentium (\*) FDIV bug occurred in the unit that performed calculations with this data type. For 10 points, identify this data type used to represent real numbers of computers, which is distinct from the integer data type.**

ANSWER: floating point

066-13-75-13105

6. **August Wilhelmj arranged the air from J.S. Bach's Orchestral Suite No. 3 for this instrument. This instrument is accompanied by an orchestra in the "Meditation" from Massenet's *Thais*. 24 *Caprices* were composed to show off the technical virtuosity of their composer on this instrument. Ludwig van Beethoven dedicated a sonata for this instrument to one of its musicians, Rodolphe Kreutzer. Jascha Heifetz played his instrument, as did (\*) Niccolo Paganini. Two of them are in most string quartets. For 10 points, name this string instrument that is higher in pitch than the viola and cello.**  
ANSWER: violin

121-13-75-13106

7. **This man was Chancellor of the Exchequer under both Ramsay MacDonald and Stanley Baldwin. As Minister of Health, this man became determined to break-up the Poor Law, which occurred when Parliament passed this man's Board of Guardians (Default) and Local Government Acts. This man, along with French prime minister Eduard Daladier, believed that he achieved (\*) "peace for our time" by signing the Munich Agreement. For 10 points, identify this British prime minister whose policy of appeasement gave the Sudetenland to Adolf Hitler.**  
ANSWER: Arthur Neville Chamberlain

146-13-75-13107

8. **In a play by Christopher Fry, the mayor of a town believes that Jennet Jourdemayne is a character of this type. The title character of Robert Burns's "Tam O'Shanter" shouts, "Weel done, cutty-sark!" upon seeing one of these characters. James I's obsession with these people may have inspired a play in which they say, "Something (\*) wicked this way comes," and chant, "Double, double, toil and trouble." For 10 points, name this type of character exemplified by the Weird Sisters in *Macbeth*.**  
ANSWER: witches

080-13-75-13108

9. **This compound is formed through the oxidation of 2-ethyl anthrahydroquinone, and it mixes with hydroquinone in the abdominal gland of the bombardier beetle. This compound is mixed with iron to form Fenton's reagent. This compound contain an oxygen-oxygen single bond, which is easily cleaved by heat or light to form two (\*) hydroxyl radicals. Mixing this compound with aluminum hydroxide forms a compound used to bleach hair. For 10 points, name this compound with formula H<sub>2</sub>O<sub>2</sub>.**  
ANSWER: hydrogen peroxide [or H<sub>2</sub>O<sub>2</sub> before it is read]

048-13-75-13109

10. **One of these structures had five boat pits and originally was connected by a causeway to a valley temple. The smallest of these structures was built for Menkaure. Only one of these structures still has near its apex the original limestone that encased all of them. That one of these structures was built by Khafre and includes as part of its complex a (\*) noseless statue of a sphinx. For 10 points, name these three structures that include a "Great" one built by Khufu in Giza to serve as tombs for pharaohs.**  
ANSWER: Pyramids of Giza [or Great Pyramid; or Pyramid of Khufu; or Pyramid of Cheops; or Pyramid of Menkaure; or Pyramid of Khafre]

023-13-75-13110

11. **This god is often depicted holding a water pot called the *kamandala* and a string of prayer beads called *aksamala*. Like his wife, he rides a swan called Hamsa. This god, who was born either from a golden egg or from a lotus flower, is the husband of Saraswati. He is usually depicted with (\*) four faces and four arms. Despite his importance, he has very few temples in India. For 10 points, name this Hindu creator god, a member of the Trimurti along with Vishnu and Shiva.**  
ANSWER: Brahma

014-13-75-13111

12. **This politician was criticized for naming supporter Tommy Cofield to the state university Board of Regents and replacing philanthropist Darla Moore. This current governor defeated Andre Bauer in a 2010 primary and Vincent Sheheen in the general election. In 2011, a proposed factory in this woman's state to produce (\*) Dreamliners was blocked by a National Labor Relations Board complaint, leading her to defend Boeing's decision to relocate operations from Washington to her state. She succeeded the scandal-plagued Mark Sanford. For 10 points, identify this current governor of South Carolina.**

ANSWER: Nikki **Haley**

110-13-75-13112

13. **In this novel, a man with a skin disease abuses his dog but is despondent when it runs away. The main character of this novel is asked by Raymond Sintes to write a letter to his ex-mistress in hopes of luring her back to punish her. Its main character has a relationship with Marie, and is prosecuted not so much for (\*) killing an Arab on the beach as for not showing emotion upon the death of his mother. For 10 points, name this novel about Meursault, a work by Albert Camus (al-BAIR kah-MOO).**

ANSWER: *The **Stranger*** [or *L'**Etranger***]

030-13-75-13113

14. **The luminosities of two types of these entities are described by the Faber-Jackson and Tully-Fisher relations. The variable surface brightness of one type of these entities was described by Gerard de Vaucouleurs, who also modified a system for classifying them resembling a tuning fork developed by Edwin (\*) Hubble. That sequence places lenticular ones at the intersection of the prongs. For 10 points, name these large systems of stars and dust that come in irregular, elliptical, and spiral varieties, and include the Milky Way.**

ANSWER: **galaxies**

014-13-75-13114

15. **Thomas Edison's studio produced a film showing this action being performed in the play *The Widow Jones*. Giotto painted a fresco for the Scrovegni Chapel of a yellow cloaked man performing this action with a haloed figure. An abstract, geometrically simple depiction of this action was sculpted by (\*) Constantin Brancusi. Gustav Klimt used gold leaf on the cloak of a man performing this action in one of his paintings, which is also seen in Alfred Eisenstaedt's photograph of a sailor and a nurse in Times Square on V-J Day. For 10 points, name this display of affection.**

ANSWER: **kiss** [or word forms]

121-13-75-13115

16. **This ruler freed his sister Joan by agreeing with Tancred of Lecce to the Treaty of Messina. This man was believed to be responsible for ordering Conrad of Montferrat's murder because of this man's support for Guy de Lusignan. This man was killed by an arrow shot during a siege of the castle of Chalus. Henry VI and Leopold V kept this man (\*) prisoner after he returned to Europe from the Third Crusade. For 10 points, name this brother of John Lackland and king of England whose courage earned him his nickname.**

ANSWER: **Richard the Lionhearted** [or **Richard I**; or **Richard Coeur de Lion**; prompt on **Richard**]

023-13-75-13116

17. In one painting by this man, a woman in a black dress and a red shawl points down at the sand where this artist's name has been drawn. That woman, the duchess of Alba, is supposedly the model for a later pair of paintings done by him, one where she is clothed and one nude. A line of French soldiers takes (\*) aim at a man with outstretched arms wearing a white shirt in another painting by this man, who painted a series of gloomy pieces directly onto the walls of "The House of the Deaf Man." For 10 points, name this Spanish artist of *The Third of May, 1808* and the Black Paintings.

ANSWER: Francisco José de Goya y Lucientes

195-13-75-13117

18. During this war, one politician received the nickname "spotty" because of his offering the spot resolutions against this war. The treaty ending this war was negotiated by Nicholas Trist. During this war, one commander was forced to flee without his artificial leg during the Battle of Cerro Gordo. This war saw a large-scale amphibious assault to take the city of (\*) Veracruz by Winfield Scott. This war was ended by the Treaty of Guadalupe Hidalgo. For 10 points, name this war fought during the Polk presidency against a southern neighbor.

ANSWER: Mexican-American War

023-13-75-13118

19. One protein found in this organelle is mutated in Hutchinson-Gilford progeria, and spaces in this organelle can be occupied by paraspeckles. Transport into and out of this structure requires the activation of Ran-GTP, and occurs through pore complexes. This organelle contains a small, (\*) dark-staining body that is the site of ribosome production, and most space in it is taken up by chromatin. For 10 points, name this organelle that contains a cell's DNA.

ANSWER: nucleus

048-13-75-13119

20. This man wrote about Ozzie Freedman in his collection *Goodbye, Columbus*. Eve Frame seeks revenge against Iron Rinn in this man's *I Married a Communist*. In a different novel, this man wrote about Nathan's realization that Coleman Silk is actually an African American who only pretended to be white. This author of *The (\*) Human Stain* also wrote a work in which the title character has a relationship with a woman nicknamed "The Monkey." For 10 points, name this Jewish author of *Portnoy's Complaint*.

ANSWER: Philip Milton Roth

149-13-75-13120

21. One king threatened to abdicate rather than allow this man's government to be replaced by another led by Charles James Fox. Quebec was split into Upper and Lower Canada under his government. Following the collapse of the Peace of Amiens, this man created an alliance with Austria, Russia, and Sweden to fight against France in one war. This man organized the (\*) Third Coalition to fight against Napoleon. For 10 points, name this British prime minister during the early nineteenth century whose father was also a prime minister.

ANSWER: William Pitt the Younger [or William Pitt II; or obvious equivalents suggesting he is the younger Pitt; prompt on Pitt]

121-13-75-13121

22. Integrating density times quantity position minus this thing, end quantity, with respect to volume, is equal to zero. For an arbitrary 2D shape, this can be found by dropping two plumb lines from different edges and seeing where they intersect. For a many body system, it is equal to the sum of each mass times its (\*) position all over the total mass. High jumpers performing the Fosbury Flop do so by having this point cross under the bar while they soar over. For 10 points, name this point where an object can be balanced.

ANSWER: center of mass [or barycenter]

201-13-75-13122

23. This man described “elephants a-pilin’ teak in the sludgy, sjudgy creek” on the road to the title city in one poem. In addition to “Mandalay,” he wrote a poem featuring a conversation between the Colour-Sergeant and Files-on-Parade regarding the hanging of the title character, and a poem about a water carrier whom the narrator states is “a better man than I am.” Those poems are “Danny (\*) Deever” and “Gunga Din,” and he also wrote a poem concluding, "You'll be a man, my son!" For 10 points, name this British imperialist poet of “If--” and *The Jungle Books*.

ANSWER: Joseph Rudyard Kipling

030-13-75-13123



1. Name these languages spoken by Jews, for 10 points each.

[10] Along with Arabic, the modern form of this language is an official language of Israel. The ancient form of this language was used to write the Torah.

ANSWER: **Hebrew**

[10] Most speakers of the modern Jewish form of this language live in Israel, where it is gradually going extinct. This was the language used to write the Talmud and is considered to be the language spoken by Jesus.

ANSWER: **Aramaic**

[10] This other nearly extinct language is a mix of archaic Spanish and some Hebrew. It was maintained by the exiled Sephardic Jews and is often called Judeo-Spanish.

ANSWER: **Ladino**

015-13-75-13201

2. The Indian mathematician Bhaskara published a proof of this statement consisting of a square with a smaller, tilted square inside it and the single word, "Behold!" For 10 points each:

[10] Name this theorem that relates the side lengths of right triangles, often written as a squared plus b squared equals c squared.

ANSWER: **Pythagorean** theorem

[10] A namesake trigonometric function is used in this generalization of the Pythagorean theorem to any triangle.

ANSWER: **law of cosines** [do not accept "law of sines"]

[10] In a right triangle, the midpoint of the hypotenuse is also this point, the intersection of the perpendicular bisectors.

ANSWER: **circumcenter** [or **center** of the **circumcircle**]

174-13-75-13202

3. Jack Ketch bungled this man's execution, having to hit him with the axe five times before he finally died. For 10 points each:

[10] Name this illegitimate son of Charles II, a Protestant who led a rebellion against the Catholic James II in 1685.

ANSWER: Duke of **Monmouth** [or James **Scott**]

[10] James II and Charles II were both members of this royal house of England. This house ruled Scotland before taking over England with the accession of James I.

ANSWER: House of **Stuart**

[10] The Duke of Monmouth fought in two of England's wars against this country in the seventeenth century. This wealthy European state established the world's first stock-exchange and gained independence from Spain in the Eighty Years' War.

ANSWER: Kingdom of the **Netherlands** [or Koninkrijk der **Nederlanden**]

080-13-75-13203

4. This character befriends Newman Noggs, the clerk of his cruel uncle Ralph, after his father's death leaves him penniless. For 10 points each:

[10] Name this boy who joins the Crummles' acting troupe after working for the one-eyed tyrannical schoolmaster Wackford Squeers.

ANSWER: **Nicholas** Nickleby [or Nicholas **Nickleby**]

[10] *Nicholas Nickleby* is by this Victorian who was paid by the installment to write critical novels such as *Oliver Twist* in serial magazines.

ANSWER: Charles **Dickens**

[10] In Dickens's *A Christmas Carol*, this sick child of Bob Cratchit is shown to Scrooge by the Ghost of Christmas Present. He often says, "God bless us, every one!"

ANSWER: "Tiny **Tim**" Cratchit [or **Timothy** Cratchit]

104-13-75-13204

5. This philosopher argued that substances can only undergo change if their "potentiality" becomes an "actuality" in his *Physics*. For 10 points each:

[10] Name this student of Plato who founded the Lyceum in ancient Greece and tutored Alexander the Great.

ANSWER: **Aristotle** of Stagira [or **Aristoteles**]

[10] This type of simple argument, with two premises and a conclusion, underlie Aristotle's logic. One example is "All men are mortal. Socrates is a man. Therefore, Socrates is mortal."

ANSWER: **syllogisms**

[10] Aristotle believed that everything has one of these end goals or purposes. The study of these things names a design-based argument for God's existence.

ANSWER: **telos** [or **teleology**; or **final causes**; or **teleological** reason/argument]

104-13-75-13205

6. For 10 points each, name these players who were on the ballot for the 2013 Baseball Hall of Fame election.

[10] The leading vote-getter was this Houston Astros catcher and second baseman; his 68.2 percent was not enough to gain entry.

ANSWER: Craig Alan **Biggio**

[10] This two-time MVP outfielder for the Braves, who later played for the Rockies, failed to gain election on his fifteenth ballot.

ANSWER: Dale Bryan **Murphy**

[10] This starting pitcher's 148-112 record, largely for the Red Sox, Rangers and Mariners, earned him a single vote.

ANSWER: Aaron Helmer **Sele**

088-13-75-13206

7. Though named as if it were one of these instruments, the cor anglais actually belongs to the oboe family. For 10 points each:

[10] Name this type of instrument that has either three or four valves, a flared bell, and a bunch of tubing wrapped into a coil.

ANSWER: French **horn** [or **corno**]

[10] The horn and trombone are members of this grouping of instruments that produce sounds when the players vibrate their lips. They are named for the material they are made of.

ANSWER: **brass** instruments

[10] This valveless kind of horn plays an off-stage solo in Mahler's Third Symphony. Mail coaches used to announce their arrival by playing it.

ANSWER: **post** horn [prompt on **coach** horn]

020-13-75-13207

8. This country agreed to form a new government under the 1992 Peshawar Accord. For 10 points each:

[10] Name this country where ten years of fighting by the mujahideen led to Soviet withdrawal in 1989.

ANSWER: Islamic Republic of **Afghanistan**

[10] This group emerged in 1994 as a powerful force in Afghanistan, and its leader Mohammed Omar led Afghanistan from 1996 until 2001.

ANSWER: **Taliban**

[10] In 2004, this man became president following the first election in Afghanistan, a position he still holds following his reelection in 2009.

ANSWER: Hamid **Karzai**

023-13-75-13208

9. In one of this man's plays, a girl cannot study because moonlight is "terrible." For 10 points each:

[10] Name this author who wrote about several people who die in the collapse of a road bridge in *The Bridge of San Luis Rey*.

ANSWER: Thornton **Wilder** [or Thornton Niven **Wilder**]

[10] Thornton Wilder also wrote this play in which Simon Stimson, the choir organist, hangs himself. Uncle Luke's farm is taken over by George Gibbs in this play.

ANSWER: **Our Town**

[10] *Our Town* is set in this fictional community.

ANSWER: **Grover's Corners**

149-13-75-13209

10. Answer these questions about medieval peasants, for 10 points each.

[10] Peasants were at the bottom of this system medieval society, which consisted of a chain of lords and their vassals.

ANSWER: **feudal** system [or **feudalism**]

[10] In the feudal system, peasants and knights served their lords in a household known by this name.

ANSWER: **manor**

[10] Some peasants had the misfortune of working this portion of the manor, which was managed by the lord personally and not held by tenants.

ANSWER: **demesne**

080-13-75-13210

11. For 10 points each, answer these questions about big prizes in the sciences.

[10] This Scandinavian began offering yearly prizes in the sciences after being horrified with his own invention of dynamite.

ANSWER: Alfred **Nobel**

[10] This navigational quantity was very difficult to calculate at sea until John Harrison's H4 reference clock made it much easier. Harrison netted 20,000 of the Royal Society's pounds for his trouble.

ANSWER: **longitude**

[10] The Clay Mathematics Institute has offered a one million dollar prize for solving any of its Millennium Prize Problems, which include proving, or disproving, this hypothesis about the location of the zeroes of a zeta function on the complex plane.

ANSWER: **Riemann** hypothesis

104-13-75-13211

12. In one scene of this novel, dialogue alternates between Rodolphe Boulanger wooing the title character and a speaker giving a lecture on fertilizer production. For 10 points each:

[10] Name this novel in which Emma has affairs with Léon and Rodolphe to escape the boredom of her life with her doctor husband.

ANSWER: **Madame Bovary**

[10] This French author wrote *Madame Bovary*. He explained his approach to style as “like God in the universe, present everywhere and visible nowhere.”

ANSWER: Gustave **Flaubert**

[10] This man is the husband of Emma Bovary. After Emma dies, he discovers her love letters from other men and dies himself quickly thereafter.

ANSWER: **Charles** Bovary [prompt on **Bovary**]

121-13-75-13212

13. This hero killed the Hydra and cleaned the filthy Augean stables. For 10 points each:

[10] Name this super-strong Greek hero who performed 12 impressive labors.

ANSWER: **Heracles** [or **Hercules**]

[10] Another of Heracles' labors was to capture the belt of Hippolyta, a queen of this people.

ANSWER: the **Amazons**

[10] For his third labor, Heracles had to capture one of these animals sacred to Artemis. Heracles received forgiveness from the goddess and let it go after bringing it in.

ANSWER: a **hind** [or the Ceryneian **hind**; or a **deer**]

080-13-75-13213

14. Techniques in this art form include the *grand jeté*, in which a performer's chest remains at the same height while they use their legs to leap forward and do a mid-air split. For 10 points each:

[10] Name this form of dance performed in Adolphe Adam's *Giselle* and Tchaikovsky's *The Nutcracker*.

ANSWER: **ballet**

[10] When doing one of these turns on one foot, ballet dancers look at a “spot” and whip their head around to find it again.

ANSWER: **pirouettes**

[10] In this ballet pose, a dancer stands en pointe with one leg and extends the other straight backwards.

ANSWER: **arabesque**

104-13-75-13214

15. For 10 points each, answer the following about the literature of Louisiana.

[10] This New Orleans resident wrote about the complex relationship between Edna Pontellier and Robert Lebrun in her novel *The Awakening*.

ANSWER: Kate **Chopin** [or Katherine **O'Flaherty**]

[10] This Tennessee Williams play is set in New Orleans and features Blanche DuBois, the former mistress of Belle Reve plantation who lost her teaching job because of an affair with a student.

ANSWER: A ***Streetcar Named Desire***

[10] This novel is set in New Orleans and was published after its author John Kennedy Toole's suicide. It features the character of Ignatius J. Reilly, an employee at Levy Pants who leads the "Crusade for Moorish Dignity."

ANSWER: A ***Confederacy of Dunces***

030-13-75-13215

16. The Cosmic Microwave Background Radiation provides evidence for this theory, which emerged as an alternative to the steady state theory. For 10 points each:

[10] Name this theory which states that the universe was created from a singularity about 13.75 billion years ago in a namesake event.

ANSWER: the **Big Bang**

[10] The Big Bang was followed by this phenomenon that saw a huge, rapid expansion in the size of the universe. It was proposed by Alan Guth.

ANSWER: cosmic **inflation**

[10] Inflation was followed by this phenomenon, in which of the currently existing matter was created as protons and neutrons combined for the first time. In general, this phenomenon is the process of creating heavier elements from lighter ones and should not be confused with fusion.

ANSWER: Big Bang **Nucleosynthesis** [or primordial **nucleosynthesis**, prompt on **BBN**]

187-13-75-13216

17. This artist painted the black Joe Gans brawling with a white boxer in *Both Members of this Club*. For 10 points each:

[10] Name this student of Robert Henri, who also painted boxing in *Stag at Sharkey's*.

ANSWER: George **Bellows**

[10] Bellows belonged to this school of art along with John Sloan and George Luks. It grew out of The Eight and created many paintings of low-income areas of New York.

ANSWER: the **Ashcan** School

[10] This other student of Robert Henri also used urban settings for paintings like *Nighthawks*.

ANSWER: Edward **Hopper**

080-13-75-13217

18. Answer the following about literary works that impacted American history, for 10 points each.

[10] Although it is untrue that Theodore Roosevelt was deeply revolted by reading this Upton Sinclair novel, it is true that its expose of the meatpacking industry contributed to the passage of the Meat Inspection and Pure Food and Drug Acts.

ANSWER: *The **Jungle***

[10] In *Grove Press, Inc. v Gerstein*, the Supreme Court reversed its ruling that this Henry Miller novel was too obscene to be published in the United States.

ANSWER: ***Tropic of Cancer***

[10] This D.W. Griffith film, based on Thomas Dixon's novel *The Clansman*, galvanized the second era of the Ku Klux Klan soon after its 1915 release.

ANSWER: *The **Birth of a Nation***

020-13-75-13218

19. A single instance of this substance can be amplified a millionfold via the polymerase chain reaction, or PCR. For 10 points each:

[10] Name this bio-polymer which contains the genetic code in base pairs along its double helix.

ANSWER: **DNA** [or **deoxyribonucleic acid**]

[10] These chemical interactions break in the denaturation step of a PCR cycle. Two of these link adenine and thymine, and they hold nucleotides together to form base pairs across the helices.

ANSWER: **hydrogen bonds**

[10] This true bacterium, found in hot springs, is the source of the heat-resistant Taq polymerase used in most PCR machines.

ANSWER: ***Thermus aquaticus***

104-13-75-13219

20. A defunct branch of the U.S. Mint was located in this city, which sits in the Eagle Valley. For 10 points:

[10] Identify this state capital named after an explorer.

ANSWER: **Carson City**, Nevada

[10] Just a few miles west of Carson City is this lake, a popular tourism destination, that straddles the California border. The portion of Nevada's western border that forms a corner lies within it.

ANSWER: Lake **Tahoe**

[10] This river flows out of Lake Tahoe and empties into Pyramid Lake.

ANSWER: **Truckee** River

019-13-75-13220

21. All carbon atoms in an alkane have this hybridization. For 10 points each:

[10] Name this hybridization that requires carbon atoms to promote one electron from a 2s orbital to a 2p orbital. It produces four equivalent bonding orbitals.

ANSWER: **sp<sup>3</sup>**

[10] The simplest hydrocarbon with sp<sup>3</sup> hybridization is this one, which consists of carbon bonded to four hydrogen atoms. It's found in natural gas.

ANSWER: **methane** [prompt on "CH<sub>4</sub>"]

[10] Within one degree, this is measure of the bond angle for sp<sup>3</sup>-hybridized atoms that do not contain any lone pairs. This bond angle produces a tetrahedral shape for methane.

ANSWER: **109.5** degrees [or **anything between 108.5 and 110.5** degrees]

190-13-75-13221