

Valencia Delta Burke Invitational 2004—Round 10
Questions by CB with Math by Boris and Science by Raj Dhuwalia and Elissa Caffery
(with some help from Illinois)

1. In order to secure a palm tree just before the start of Hurricane Charlie a math professor tied the very top of the tree to the ground. He used exactly 10 feet of rope and tied it on the ground 6 feet away from the tree. Assuming that the tree stands at a 90 degree angle with the ground, what is the height of the tree in feet?

A. 8 feet

2. In this work the Reverend John Hale's faith in the goodness of the courts is contrasted with Reverend Parris's manipulation of those courts to protect his daughter, Abby. A misunderstood comment about his wife's books end up leading to the torture and execution of Giles Corey, prompting Elizabeth to beg her husband John Proctor to confess to save himself, though in the end Proctor refuses and is hanged. Allegorically meant to condemn the hysteria caused by the House Un-American Activities Committee, FTP what is this 1953 play about the Salem witch trials by Arthur Miller?

A. The Crucible

3. The owner and namesake was a top executive for the Excelsior Company, which manufactured bicycles and sewing machine supplies. He bought a lot at the intersection of 58th and Woodlawn and construction began in 1909. The narrow dimensions of the lot excited the architect's desire to work horizontally, leading to its striking low-pitched roof, which extends dramatically beyond the house's exterior walls covering an outside ambulatory. Sitting near one corner of the University of Chicago campus, FTP name this residence, the epitome of the Prairie Style, designed by Frank Lloyd Wright.

A. Robie House

4. The plot named for him charts the natural log of the rate constant versus one over temperature. His namesake equation is an exponential equation which relates the steric factor, rate constant, activation energy, and temperature. FTP, who was this Swedish chemist, who also defined a base as a species which increases the hydroxide ion concentration in water?

Answer: Svante Arrhenius

5. Moved by the plight of Jews expelled from Spain by Ferdinand, in the 1520s this ruler ordered the building of a fortress wall around Jerusalem. Under him his empire reached its greatest territorial extent, spurred by the capture of Malta, Belgrade, and all of Hungary, which came after his victory at the Battle of Mohacs (mo-hotch). Called "Kunani," or the lawgiver, by his own people, FTP name this Ottoman sultan called "the Magnificent" by the West.

A. Suleiman the Magnificent (acc. Suleiman I)

6. According to Quintus Smyrneus, the image of this creature graced the shield of Eurypylos, son of Heracles. Hesiod said it had 50 heads and was the spawn of Typhon and Echidna, and though later sources reduced the number of heads, most chroniclers agree that its tail was a serpent. Orpheus was one of the few to get past him, soothing him with his lyre music. FTP name this guardian of Hades, a three-headed dog.

A. Cerberus

7. This author's 1995 memoir Paula describes the coma and then death of her daughter from a porphyria disease. Born in Lima in 1942, other works include her second novel, *Of Love and Shadows*, and her third, *Eva Luna*. Her first novel, a 1982 work focusing on the women of the Trueba family, remains her best known. FTP name this author of *The House of Spirits* who had to flee Chile in 1973 after the assassination of her Uncle Salvador.

A. Isabel Allende

8. In its Plano Piloto, or master plan, this city was meant to have three administrative regions: Lago Sul, Lago Norte, and a namesake region. The Piloto Plano was developed by Lucio Costa, and it was meant to have no more than 500,000 residents, though now it tops two million. Its cost overruns in the early 1960s were in part responsible for the military coup that toppled the Jango Administration, though it had been begun by the previous president, Juscelino Kubitschek. With buildings designed by Oscar Niemeyer, FTP name this planned city, the capital of Brazil.

A. Brasilia

9. Meso ["MEE-soh"] compounds lack this property, and the Cahn-Ingold-Prelog convention is used to designate this property. Labeled R or S, compounds with this property cause plane-polarized light to rotate. It requires a stereocenter carbon which is bonded to 4 different groups, and any compound with this property must have an enantiomer. FTP, named from a Greek word for "hand," this is what property in which a compound is not superimposable with its mirror image?

Answer: chirality ["ky-RAL-i-ty"] or chiral (prompt on "handedness")

10. Its penultimate provision calls for an independent Polish state to include all "territories inhabited by indisputably Polish populations." The second insists on freedom of the seas in peace or war. The seventh argues that Belgium "must be evacuated and restored, without any limit to [its] sovereignty." The 12th calls for "the Turkish portions of the present Ottoman Empire" to remain sovereign, but all of its other lands to become autonomous. With its last laying the groundwork for The League of Nations, FTP name this document written after WWI by Woodrow Wilson.

A. Fourteen Points for Peace

11. This author of *Letter Concerning Toleration* lived some college students' dream, entering Christ Church College, Oxford, in 1652, and staying (with some gaps) for the next thirty years. He wrote of learning methods in 1693's *Some Thoughts Concerning Education* and economics in *Some Consequences of the Lowering of Interest and the Raising of the Value of Money*, and defended his faith in *The Reasonableness of Christianity*. FTP name this polymathic author better known for *Two Treatises on Government* and *Essay Concerning Human Understanding*.

A. John Locke

12. Born in 1984, at age 11 she was the youngest person ever admitted to the School of American Ballet. She had a bit role in the sitcom *Malcolm in the Middle* and played Monique in the fine film *The Hot Chick* before landing a regular role as Cecilia on *Seventh Heaven*. Apparently, her song "Shadow" is about stepping out of the shadow of her older sister's fame. FTP name this talented singer-songwriter who surely didn't need the backing tracks she apparently was using during a tumultuous recent episode of *Saturday Night Live*.

A. Ashlee Simpson

13. At the end of this story readers find out that the narrator is a man in a tavern who sold the story to a writer only known as "D.K." The narrator describes the competition between two suitors for a young singer, "plump as a peach." Abraham, better known by a nickname, plugs up the other suitor's chimney and trains a dog to howl while the latter gives singing lessons to Katrina von Tassel. Eventually, FTP, Brom wins Katrina by scaring Ichabod Crane away in what work by Washington Irving?

A. The Legend of Sleepy Hollow

14. The German plan preceding it was originally codenamed "Watch on the Rhine" but was renamed "Autumn Mist" before taking place. On its second day soldiers of 1st SS Panzer Division machine-gunned nearly 80 American POWs in what has become known as the Malmedy Massacre. The German goal of quickly reaching the North Sea was quashed by steadfast defense led by the American 106th Infantry Division in the Ardennes. Beginning in December, 1944, and ending in January, 1945, FTP name this last-ditch German effort named for the effect it had on the Allied line.

A. Battle of the Bulge

15. This phenomenon can occur in materials with a high relative permeability, but it breaks down at the Curie temperature. Resulting from an alignment of domains by an external field, this phenomenon explains why a solenoid with a metallic core can have a field 5,000 times stronger than one with an air core. FTP, name this type of magnetism seen in cobalt, nickel, and iron.

Answer: ferromagnetism

16. This was first studied in the laboratory by Darley and Latane in 1968, and some explanations for it are pluralistic ignorance, social inhibition, and diffusion of responsibility. While the cases of Deletha Ward and James Bulger are well documented, the most famous case of this phenomenon is that of the 19-year-old Kitty Genovese, in which 37 New Yorkers failed to help the victim of a stabbing. For ten points, name the effect in which an increased number of observers to an event requiring some response greatly decreases the likelihood of one's making that response.

A. bystander effect

17. This region is bounded by the Bihor Mountains and its namesake Alps, and is sometimes considered to include its neighboring regions of Maramures, Crisana, and Banat. This area served as the nucleus for the Roman province of Dacia, and it contains the Olt and Mures rivers. For ten points, name the region of Romania perhaps most famous for a mythical member of its nobility.

A. Transylvania (or *Transilvania* or *Erdély* or *Siebenbürgen*)

18. Radical Republican Thaddeus Stevens asserted of the decision in this Supreme Court case that although "not as infamous as the Dred Scott decision, [it] is yet far more dangerous in its operation." Stevens had little sympathy for the plaintiff, a Copperhead who had been sentenced to death for subversive activities in 1863, a verdict delayed by Lincoln and then appealed after Lincoln's assassination. The plaintiff had been sentenced by a military tribunal in Indiana, despite that state having its civilian courts operating. FTP name this important 1866 civil rights case.

A. Ex Parte Milligan

19. "Oh! The Public" is one of this author's few comic short stories. More serious examples include "The Steppe," "The Black Monk," and "A Dreary Story." Better known as a dramatist, one of his famous dicta was, "If there is a gun hanging on the wall in the first act, it must fire in the fifth act." A gun features prominently in one of his major dramas, in which the title bird is shot by Kostya. FTP name the Russian author of that play, *The Seagull*, as well as *The Three Sisters* and *Uncle Vanya*.

A. Anton Chekhov

20. Much of the constellations Sagitta and Vulpecula are inside this asterism, and its faintest member is the 19th-brightest star in the sky despite being over 1,600 light years away. The second brightest member is the alpha star of Aquila, and its brightest star, with a magnitude very near zero, is the alpha star of Lyra. FTP, name this northern asterism associated with a season and consisting of the stars Altair, Vega, and Deneb.

Answer: the Summer Triangle

Valencia Delta Burke Invitational 2004—Round 10 Bonuses

1. The sun is a mass of incandescent gas. Elaborate on that FTPE.
 - A. This bright, opaque region of the sun is at a temperature of about 6000 K.
A. photosphere
 - B. Although less luminous than the photosphere, this thin “atmosphere” of the Sun, visible in eclipses, is at over 1 million K.
A. corona
 - C. The corona dwindles into this stream of charged particles, mostly protons, ejected from the sun’s outer atmosphere.
A. solar wind

2. Stuff about recent happenings in that Mess o’Potamia FTPE.
 - A. This city west of Baghdad is in the process of being re-taken by US and Iraqi forces right now.
A. Fallujah
 - B. Fallujah is a stronghold of members of what now-banned political party once led by Saddam?
A. Ba’ath
 - C. US forces really wanted to capture this terrorist responsible for many recent beheadings who had been using Fallujah as his base, but he’s likely escaped.
A. Mohammed al-Zarqawi

3. Answer the following FTPE about the man for whom soon everything in the US will be named.
 - A. Ronald Reagan is the only US president to have been a member of a union, serving as president of what group?
A. SAG (or Screen Actors Guild)
 - B. Reagan chose George Bush to be his VP despite Bush’s having correctly described Reagan’s trickle-down ideas with this two-word term.
A. voodoo economics
 - C. 138 of the Reagan administration’s appointees either were indicted or resigned under ethical suspicions; my personal favorite was this Attorney General famous for a namesake report on pornography.
A. Ed Meese

4. Identify the Romantic poet who wrote the following on a 10-5 basis.
 - A. (10 pts.) “The Giaour”; “The Destruction of Sennacherib”
(5 pts.) “She Walks in Beauty”
A. George Gordon, Lord Byron
 - B. (10 pts.) “Hymn to Intellectual Beauty”; “Ode to the West Wind”
(5 pts.) “Adonais”; “Ozymandias”
A. Percy Bysshe Shelley
 - C. (10 pts.) “The Aeolian Harp”; “Christabel”
(5 pts.) “Dejection: an Ode”; “Kublai Khan”
A. Samuel Taylor Coleridge

5. Sometimes you should just keep your mouth shut: identify these seers who should’ve FTPE.
 - A. This man warned the Trojans not to take in that horse built by the Greeks, so Poseidon sent a sea serpent to kill him and his sons.
A. Laocoon (Lay-uh-COH-un)
 - B. Apollo cursed this Trojan maid by giving her foresight, but not allowing anyone to believe her prophecies; she was butchered by Aegisthus and Clytemnestra along with Agamemnon.
A. Cassandra [CONT’D NEXT PAGE]

C. After vainly urging Oedipus to drop his investigations into the death of King Laius, this seer eventually died after drinking from the spring of Tilphussa.

A. Tiresias

6. Answer the following pertaining to probability FTP each:

A. If the probability that it will rain is $\frac{3}{4}$, what is the probability that it will not rain?

A. $\frac{1}{4}$

B. One person is to be selected at random from 6 loan officers and 4 bank managers. Find the odds in favor of a loan officer being selected.

A. $\frac{3}{2}$ or 3 to 2

C. One card is to be selected at random from a well shuffled deck of 52 cards. What is the probability that the card is a red card or a king?

A. $\frac{29}{52}$

7. Identify these instruments found in an orchestra FTPE.

A. Twelve to sixteen feet of coiled brass, instruments in this family have 3-5 valves; in the US the main orchestra version is keyed in B-flat and has a range all below middle C.

A. tuba

B. Generally considered the most important woodwind in the orchestra, this 26-inch instrument is also the youngest; the B-flat and A varieties are most common.

A. clarinet

C. Played with fourteen-inch wooden sticks, this percussion instrument can have its pitch changed by a foot pedal.

A. timpani

8. Answer the following about that big year in English history, 1066, FTPE.

A. This ruler died early in 1066, leading to a crisis of succession.

A. Edward the Confessor

B. Harold Hardrada, who claimed the throne as a descendant of Canute, was ruler of this country.

A. Norway

C. Hardrada was defeated at Stamford Bridge by this Anglo-Saxon, who a few weeks later got served by William of Normandy.

A. Harold I (or Harold Godwinson)

9. Given a description, name the short story by Ernest Hemingway FTPE.

A. The older waiter in this story longs for the titular location, hoping it will ward off his existential dread and sense of "nada."

A. "A Clean, Well Lighted Place"

B. The writer protagonist of this story hallucinates that he is being flown to the top of the titular mountain as he dies of gangrene in Africa.

A. "The Snows of Kilimanjaro"

C. The title character is shot by his wife while on safari, though the title implies that he might have finally found happiness.

A. "The Short, Happy Life of Francis Macomber"

10. Name these insect orders FTPE.

A. Beetles belong to this order.

A. Coleoptera

B. These are known as the "true bugs" and include stink bugs.

A. Hemiptera

C. Ants, bees, and wasps belong to this order.

A. Hymenoptera

11. Answer the following about a certain small island nation FTPE.

A. With capital at Manama, what island nation is ruled by an emir from the al-Khalifa family?

A. Bahrain

B. Bahrain sits in what body of water?

A. Persian Gulf

C. Bahrain sits due west of what small nation that only borders Saudi Arabia?

A. Qatar

12. Identify these famous economists by the sites of their graves, for ten points each.

A. He was buried in Canongate Churchyard, Royal Mile, Edinburgh in 1790.

A. Adam Smith

B. His body is on display in the lobby of University College, London, England.

A. Jeremy Bentham

C. Although German by birth, he was buried in Highgate Cemetery, London, in 1883.

A. Karl Marx

13. Answer the following about a Republican smear campaign against John Kerry FTPE.

A. Kerry was in charge of one of these US river vessels in Vietnam; hint: this two-word term preceded the words "Veterans for Truth" in the name of a despicable group that viciously distorted Kerry's record in ads.

A. swift boat

B. Swift Boat Veterans for Truth, as well as MoveOn.org and other groups that were not constrained by campaign ad rules, have been referred to by this three-digit number, referring to the tax code governing them.

A. 527s

C. This former Georgia senator who lost parts of three limbs in Vietnam generated some publicity when he tried to hand deliver a letter condemning the Swift Boat Veterans ads to W's ranch.

A. Max Cleland

14. A pirate's knowledge of chemistry is narrow, but deep. Answer these questions FTPE or be keelhaunched.

A. This element, the favorite of pirates, was discovered by Baron Rayleigh, who observed that nitrogen isolated from air was too heavy and must be contaminated with an unreactive gas.

A. Argon

B. This most basic amino acid has a guanidinyll side group. Pirates love it.

A. Arginine

C. All pirates prefer this definition of acids and bases, which states that acids form hydrogen ions and bases form hydroxide ions.

A. the Arrhenius definition (or concept)

15. Answer the following about the series of works called *Le Comedie Humaine*, or The Human Comedy FTPE.

A. First, who wrote it?

A. Honore de Balzac

B. One of the best known of the series, this novel focuses on a title father who slowly loses his fortune as well as his friends and daughters while boarding at Madame Vanquer's home.

A. Pere Goriot (acc. Old Goriot)

C. Finally, what American author also wrote a novel with the title The Human Comedy?

A. William Saroyan

16. Pencil and paper ready. A function has the equation $f(x) = x^3 + 4x^2 + 35x + 10$. For 15 points each:

A. Find $f'(x)$.

Answer: $3x^2 + 8x + 35$

B. Find the value of x for which an inflection point exists. You have 10 seconds.

Answer: $x = -8/6$ or $-4/3$

17. Show what you know about a certain religion based in India FTPE.

A. Though they share a belief in reincarnation and moksha with Buddhists and Hindus, adherents of this religion believe in one god that doesn't incarnate itself, don't worship idols, and follow what are known as the "Five K's."

A. Sikhs (pronounced "sick," actually)

B. The ten great teachers of the Sikh faith, including its founder, Nanak, and the last Gobind Singh, are given this title.

A. Guru

C. Since the passing of Gobind Singh, the only Sikh Guru has been this book, the faith's holy scripture.

A. Adi Granth (acc. Guru Granth Sahib from the guy wearing the turban)

18. Answer the following about a certain Athenian leader FTPE.

A. Under the leadership of this man, the Parthenon and other buildings on the Acropolis were erected.

A. Pericles

B. Under Pericles rule in 454 the headquarters of this strategic alliance was moved from its namesake island to Athens.

A. Delian League

C. Pericles' famous funeral oration is recorded in the major work of this historian.

A. Thucydides

19. ID these writers from tribal backgrounds for fifteen points each.

A. This Spokane tribesman wrote the novels *Reservation Blues* and *The Toughest Indian in the World* as well as the screenplay for the movie *Smoke Signals*.

A. Sherman Alexie

B. This Kiowa is best known for the collection of folktales *The Way to Rainy Mountain* and the novel *House Made of Dawn*.

A. N. Scott Momaday

20. Answer these questions about antibiotics FSNOP

A. (5 pts.) This first antibiotic was discovered by Fleming in 1928.

A. penicillin

B. (15 pts.) This is considered the "drug of last resort" for killing bacteria, especially Staphylococci, that are resistant to penicillin and other antibiotics.

A. vancomycin

C. (10 pts.) Both penicillin and vancomycin inhibit the synthesis of this peptide/carbohydrate substance that makes up bacterial cell walls.

A. peptidoglycan