

Tossups

1. A family of formulas used for performing this procedure uses weights derived from Lagrange interpolation polynomials. The $\frac{3}{8}$ rule and Boole's rule are closed examples of those formulas named for Newton and Cotes. Roots of families of orthogonal functions are used as nodes for Gaussian quadrature, one form of this process. Two different types of this operation are used in (*) Green's theorem, which can be generalized by Stokes' theorem. The order in which two of these operations occur can be switched by Fubini's theorem. This operation can be roughly approximated by Simpson's rule or Riemann sums. Finding the area under a curve is performed by - for 10 points - what operation that is the inverse of differentiation?

ANSWER: integration [or integrals, accept line integrals or surface integrals or numerical integration] <AK, Math>

2. In this year, the "People's Party" attempted to nominate a certain governor for president on the San Jacinto Battlefield. A breakaway party in this election nominated the youngest ever Vice President as their presidential nominee. In this election year, the William Yancey-led (*) "Fire-Eaters" walked out of the Democratic National convention and nominated their own candidate, John C. Breckinridge. That move followed the nomination of a man whose Freeport Doctrine was seen as insufficiently in favor of Dred Scott, Stephen Douglas. After the election in this year, South Carolina declared its secession from the United States. For 10 points, name this election year, which elected Abraham Lincoln to his first term.

ANSWER: 1860 [accept Election of 1860; prompt on '60 alone] <AK, U.S. History>

3. A resident of this location gives her children names meaning "Death may please himself" and "Death, I implore you" after her children keep dying in infancy. An event in this location inspires "perhaps not a whole chapter, but a reasonable paragraph" in a Commissioner's upcoming book. The arrival of a dark cloud of locusts in this location prompts children to excitedly collect them in pots. A compassionate missionary stationed in this place named (*) Mr. Brown is replaced by an intolerant preacher named James Smith. A character is exiled from this place after committing the "feminine crime" of accidentally killing Ezeudu's son during a funeral. This village is home to a yam-farmer who kills a boy who calls him "father" named Ikemefuna. For 10 points, name this village where Okonkwo fails to start a revolt at the end of Chinua Achebe's novel *Things Fall Apart*.

ANSWER: Umuofia [generously prompt on "Nigeria" or even "Africa" until "exiled" is read] <SS, World Literature>

4. TEMED is used alongside ammonium persulfate to create media in the preparatory step for a variant of this technique. The 2D variation of this technique distinguishes molecules both by their masses and their isoelectric points. Tris is mixed with glycine with Laemmli buffer, which is used in a specific version of this technique, although more generalized variants often use other Tris based buffers like (*) TBE or TAE. Performing this technique for too long or with too high intensity can result in "smiling." A variant of this technique which uses polyacrylamide as a medium to separate molecules by weight is called SDS-PAGE. Ethidium bromide is used to visualize DNA under UV light in this technique. For 10 points, name this technique in which proteins are separated via application of an electric field.

ANSWER: gel electrophoresis [accept SDS-PAGE before mention] <SS, Biology>

5. One enemy of this man was assassinated by Balthasar Gérard after this ruler called that enemy "a pest on the whole of Christianity and the enemy of the human race". This ruler secured his claim to a certain region after forces loyal to him won the Battle of Alcantara under the leadership of the "Iron Duke". This ruler had Juan de Lanuza executed after Antonio Pérez escaped trial and, along with Henry II, this ruler signed the Treaty of (*) Cateau-Cambresis. This ruler commissioned the building of a royal site at El Escorial. This husband of

Mary I of England failed to put down the Dutch Revolt, and Elizabeth I defeated this ruler's forces composed of the largest fleet in history in 1588. For 10 points, name this Habsburg king of Spain who launched the Spanish Armada.
ANSWER: **Philip II** of Spain <AK, European History>

6. Upon entering these structures, one should offer sandalwood to a masked priest who accepts the offering with silver tongs. The central components of these structures can be classified as the “court” variety, one “of victory”, or of itself. Visitors to these places typically increase during *Gahambars* and Noruz. The leaders of these religious structures are known as (*) dasturs, and because of the Ab-Zohr rite at the end of the Yasna service that takes place in these religious structures, they must be located near natural water. These structures contain *atar* in the center, and Ahura Mazda is venerated in these structures. For 10 points, name these houses of worship in Zoroastrianism, named after the title hot substance.

ANSWER: **fire temples** [or **dar-e mehr**; or **agiyari**; prompt on “Zoroastrianism temples” before mention] <AK, Religion>

7. In one work, this thinker included building a fence and help from others as part of a list of twelve factors that influence the outcomes of personal crises. This thinker wrote about a walk on the beach in which he is approached by a politician demanding to know why his people lacked any “cargo”. In one work, this thinker used the contrast between two farms to begin a book which provides a five-part framework to explain why certain societies experience the title phenomenon. This author of (*) *Upheaval* wrote another work stating that the abundance of domesticable animals in Europe led to its conquest of the world through the three title concepts. For 10 points, name this anthropologist who wrote *Collapse* and *Guns, Germs, and Steel*.

ANSWER: Jared **Diamond** <AZ, Social Science>

8. The enzyme vanadium nitrogenase is notable for its ability to reduce this compound into ethylene, ethane and propane. This compound replaces hydrogen cyanide in a reaction in which aromatic compounds are formylated by a mixture of this compound and hydrogen chloride. That modification of the Friedel-Crafts reaction is the Gattermann–Koch reaction. This compound aids in the purification of (*) nickel by binding to it in the Mond process. It is the heavier of the two primary compounds used in syngas. This compound is consumed along with water in the water-gas shift reaction. This compound is formed alongside water during incomplete combustion. For 10 points, name this noxious gas with formula C-O.

ANSWER: **carbon monoxide** [or **CO** before mention] <SS, Chemistry>

9. In this novel, the imprisonment of the activist Tom Mathlong prevents one character from ever delivering a letter to him. A successful writer in this novel recounts her experiences in World War II in the book *Frontiers of War*; that writer is devastated when she realizes that her daughter desires to go to boarding school. In this novel, (*) Tommy is blinded after shooting himself in the head, and it begins with the protagonist engaged in a lively discourse with the boyish Molly Jacobs. The frame story “Free Women” is interspersed between the four sections of this work, which are titled for the colors black, red, yellow, and blue. For 10 points, identify this novel in which Anna Wulf attempts to synthesize her feelings to the title story of her life, a work by Doris Lessing.

ANSWER: The **Golden Notebook** <AZ, British Literature>

10. Frederic Ashton choreographed a famous *pas de deux* featuring a “weightless spirit” based on an intermezzo from an opera by this composer. The premiere at that opera featured a wardrobe malfunction during a striptease by soprano Sybil Sanderson. It's not Tchaikovsky, but Charlotte sings the Letter Aria in an opera by this composer that ends with children singing Christmas carols after a bloody suicide. (*) In another opera by this composer, the protagonist burns down her house to join Athanaël's convent. That protagonist, a devotee of Venus, contemplates converting to Christianity while an intermezzo entitled *Meditation* plays in the background. For 10 points, name this French composer of *Werther* and *Thais*.

ANSWER: Jules Massenet <DB, Other Fine Arts>

11. **The Uzbek Hajji Bi Ming formed a mutual friendship pact with one leader of this empire. This empire, which was toured by the Elphinstone Mission, employed the advanced siege gun Zamzama. This empire perpetrated the Wadda Ghalughara massacre against the Sikh Empire, after which it commenced a sack of Amritsar in which a piece of shrapnel cut off part of its ruler's nose. The founder of this empire made a surprise crossing of the Jamuna River to win a decisive victory against the (*) Maratha Confederacy at the Third Battle of Panipat, but was unable to capitalize on that victory because of a rebellion in Kandahar. For 10 points, identify this Empire founded by Ahmad Shah, which at its height encompassed almost all of modern-day Afghanistan.**

ANSWER: Durrani Empire [accept Saddozai Kingdom] <AZ, World History>

12. **This author described his delight at seeing an imperfect patch of rust immediately taken away by a crewman who paints over it right before “walking off with a nod.” Multiple run-ins with PETA at a Maine food festival lead to a discussion of how to minimize suffering in an essay by this author. In one essay, this author described his overwhelming despair while on the *Zenith*, a (*) cruise ship he renames the *Nadir*. A character sticks his head in a microwave after founding the Enfield Tennis Academy in a novel by this author. That character, James Incandenza, creates a film which causes its viewers to lose interest in everything else. For 10 points, name this author best known for the essays “Consider the Lobster” and “A Supposedly Fun Thing I’ll Never Do Again.” as well as his heavily footnoted novel *Infinite Jest*.**

ANSWER: David Foster Wallace [accept DFW] <SS, American Literature>

13. **This work describes a “pale criminal” who murders because he loves “the joy of the knife”, and this work criticizes high levels of literacy for simplifying authors’ works so that commoners can read it. This work compares the pandering masses to poisonous flies in a marketplace, and this work discusses three stages of metamorphosis: a (*) camel, a lion, and a child. This work discusses a tightrope walker representing man walking over an abyss bridging the beast to the overman. The title character of this work wonders if a hermit in the forest has heard that God is dead. For 10 points, name this Friedrich Nietzsche work that follows the title Zoroastrian prophet.**

ANSWER: Thus Spoke Zarathustra: *A Book for All and None* [or Thus Spake Zarathustra; or Also Sprach Zarathustra] <AK, Philosophy>

14. **The fantasia is a style of horsemanship performed by the Chaoui people who live in a portion of this range. One section of this range is separated from a different range to the north by the Sebou River. The Ourika River rises in one section of this range, which is cut through by the Draa Valley. The cities of Tafilalet and (*) Ouarzazate are located in a portion of this mountain range. The Hautes Plaines is contained within this range. This range, which contains the Tell Mountains, is located southeast of the Rif Mountains. This range has its highest point at Jebel Toubkal and is populated by many Berbers. For 10 points, name this mountain range that runs through Morocco, Algeria, and Tunisia, which shares its name with the Greek titan cursed to hold up the sky.**

ANSWER: Atlas Mountains <AK, Geography>

15. **A marble statue of a woman holding a shield with a screaming head attached to it appears in this work's top right-hand corner. A soldier twists around to listen to a man in brown robes in this painting. A man in blue lounges across a stairwell while reading a paper in the middle of this painting. The arched structure of a roof in this painting was possibly modeled on St. Peter's Basilica. The artist of this painting depicted (*) himself in the bottom right corner as the only figure looking directly at the viewer. A figure who rests his head on his hand and looking down is thought to depict Michelangelo. This painting in the Stanza della Segnatura is centered around Aristotle with his palm towards the earth and Plato pointing up. For 10 points, name this fresco by Raphael.**

ANSWER: *The School of Athens* [or Scuola di Atene] <SS, Visual Fine Arts>

16. It's not Zeeman, but an effect named for this scientist forms the basis for MCD spectroscopy. The magnitude of that effect is equal to the product of magnetic field, path length, and the Verdet constant. A law developed by this scientist states that the mass of a compound deposited at a charged electrode is linearly proportional to the charge. An effect named for this scientist describes the (*) rotation of a magnetic field with regards to its plane of polarization. Lenz's law is the origin of the negative sign in an equation named for this scientist that uses the magnetic flux to calculate the induced EMF. For 10 points, name this scientists who names a both a law of induction and the SI unit of capacitance.

ANSWER: Michael Faraday <SS, Physics>

17. *Note: Description acceptable* An Herb Block cartoon published the morning of this event shows one of its primary participants asleep in an army cot while an elderly man blasts a trumpet in his ear. This event occurred after Joe Martin read a letter ending with the assertion that "there is no substitute for victory." In a speech before Congress in the aftermath of this event, one of its participants recalled an old barrack ballad before famously stating, (*) "Old soldiers never die, they just fade away." This event, which was prompted by an ultimatum promising the destruction of "Red China", led to the elevation of Matthew Ridgway to the rank of general. For 10 points, identify this event in which the American commander in the Far East was dismissed by a U.S. president during the Korean War.

ANSWER: Harry S. Truman's firing of Douglas MacArthur [accept clear-knowledge equivalents] <AZ, American History>

18. During a debate with Elon Musk, the founder of this company claimed that "99.99% of predictions that human beings [have] had [are] all wrong," prompting Musk to retort "including that one?" This company, which operates the logistics firm Daraz, announced in November 2019 that it had signed a deal acquiring exclusive club content from Manchester United; that deal came four years after it completed a stunning \$4 billion purchase of (*) Youku. Tmall is a platform run by this company that allows for businesses to sell name-brand products. Daniel Zhang succeeded as CEO of this company after the retirement of its founder Jack Ma. For 10 points, what Chinese e-commerce company is named after a poor woodcutter who finds a den of forty thieves?

ANSWER: Alibaba Group [accept Alipay until "Daraz"] <AZ, Current Events>

19. A scene in this work features a character whose wish to be married before dying is satisfied by his uncle assuming a female form. A character in this work vows to kill his son's murderer by nightfall of the next day, which he accomplishes after another character covers up the sun with a disc. An army in this work kills an elephant to trick an opposing leader into believing that Ashwatthama is dead. One character in this work shoots a moving (*) fish eye through the reflection of oil to win Draupadi's hand in marriage, angering his enemy Duryodhana. In a passage from this work, Krishna advises Arjuna on moral philosophy. For 10 points, name this Hindu epic detailing the struggle between the Pandavas and the Kauravas, which contains the *Bhagavad Gita*.

ANSWER: Mahabharata [do not accept or prompt on "Bhagavad Gita"] <AK, Mythology>

20. In one of these speeches, the speaker claims that in times of crisis, one ought not to fear "the imputation of over-diligence." In another of these speeches, a figure is portrayed as "mad with audacity" and "breathing wickedness"; that speech decries the "hopes of plunder" of the Sullan legions stationed at Faesulae. Cesare Maccari depicted a famous scene from one of these speeches in which their addressee sits completely (*) alone while dozens of toga-clad men stare at him in disapproval. The first of these speeches rhetorically asks its addressee, "When...do you mean to cease abusing our patience?" For 10 points, identify this set of orations delivered by Marcus Tullius Cicero against the formulator of a namesake conspiracy against the Roman Senate.

ANSWER: The Catilinarian Orations [accept any answer mentioning a set of orations against Lucius Sergius Catiline or Lucius Sergius Catilina, prompt on “orations by Marcus Tullius Cicero” and equivalents] <AZ, Other/Ancient History>

21. **This band featured on FRENSHIP’s debut album *Vacation* on the song “Won’t Let You Go”. This band released an expanded version of their latest album, subtitled “(This Got Out Of Hand Edition)”, with songs such as “Admit Defeat” and “Final Hour”. This band, which is fronted by (*) Dan Smith, recently released their third studio album *Doom Days*, which features tracks such as “Those Nights” and “Quarter Past Midnight”. This band collaborated with Marshmello on the song “Happier”, and this band sings “the walls kept tumbling down in the city that we love” in their most famous song. For 10 points, name this British indie pop band behind the song “Pompeii”.**

ANSWER: Bastille <AK, Trash>

22. **One work by this writer ends with a chorus of frogs calling out the words “Glad! Glad!”; the protagonist of that work arrives at “the first hour after midnight” at the town of Kremen. This writer of *Children of the Soil* wrote another work in which a character feels heaven open up before him after he severs the heads of three rebels with one blow; that character, Pan Longin, ultimately dies in a rebellion led by Bohun (*) Khmelnytsky. This author, who included *With Fire and Sword* in *The Trilogy*, wrote a work in which the advances of Poppaea Sabina are flatly rejected by a general desperately seeking to marry Lygia; that general, Marcus Vinicius, converts to Christianity during the reign of Nero. For 10 points, identify this Polish author of *Quo Vadis*.**

ANSWER: Henryk Sienkiewicz <AZ, European Literature>

23. **Samples that have undergone upwelling appear to have erroneously high values for this quantity due to the Marine reservoir effect. Zircon crystals can be used to measure this quantity in samples with exceedingly high values for it. Index fossils can be used to determine a “relative” value for this quantity, which is always lower for (*) intrusions than the sediment around them according to the law of cross-cutting relationships. For a layer of sediment, this quantity tends to be greater than strata above it according to the law of superposition. Radioactive isotopes like potassium-40 and carbon-14 are used to determine this value for a sample in radiometric dating. For 10 points, name this quantity often used to determine what geologic time period a sample is from, often measured in millions of years.**

ANSWER: age [accept descriptive answers indicating how old something is] <SS, Other Science>

24. **This composer placed a virtuosic intermezzo in between the 13th and 14th sections of a set of 20 variations on *La Folia*. In a piece by this composer, the orchestra begins the first movement with the repeated melody (read slowly) C-D-C-D-C-B flat-A flat-B flat-G. The second movement of that piece has a flute introduce the clarinet solo that takes up much of the movement. (*) Tianxu An was forced to play a piece by this composer prematurely after a mix up at the 2019 Tchaikovsky Competition. This composer of *Variations on a Theme of Corelli* dedicated his second piano concerto to Nikolai Dahl, his hypnotherapist. For 10 points, name this Russian composer of four piano concertos and *Rhapsody on a Theme of Paganini*.**

ANSWER: Sergei Rachmaninoff <SS, Auditory Fine Arts>

Bonuses

It has nothing to do with football, but NFL quarterback Gary Hogeboom was the first to perform this action while in the guise of a landscaper. A comically bad failed attempt at this action was done by Jason Siska, as the item he used for it was a literal stick. This

action became more powerful in its Cook Islands variation, leading many to suspect racial bias behind this action's change. Another version of this action led to the downfall of Erik Reichenbach, a rarity since he himself decided its effect. More recently, four of these actions occurring in one night led to the automatic (*) elimination of Cirie Fields. Kelley Wentworth performed this action on herself, eliminating Andrew Savage despite having a three to nine minority. For ten points, what action is used to negate votes against the target on a reality show hosted by Jeff Probst?

ANSWER: playing an immunity idol on Survivor (you could give the correct answer for this a million different ways, so I'll adjudicate if it's not blatantly correct)