

1. This statement provides the duality between the homology of chains and the de Rham cohomology. This statement can be used to show that the codifferential is the adjoint of the exterior derivative when considering the Hodge dual on manifolds. This statement is used to generate a contradiction when smoothly retracting a ball onto its boundary in the proof of the Brouwer fixed point theorem. The most general form of this statement relates the integral of the exterior derivative of a differential form over some manifold to its integral over the boundary of the same manifold. For a planar curve, this result reduces to Green's theorem. For 10 points, name this theorem from vector calculus, which states that the surface integral of the curl of a function dotted with the normal is equal to the line integral of the function around a boundary of the surface.

ANSWER: Stokes's theorem

2. After one coup d'état in this nation, the intelligence organization MIT used Ziverby villa as a torture center for counter-guerrillas; that coup was called the "Coup by Memorandum". One leader of this nation maintained his nation's neutrality at the Second Cairo Conference. A coup in this country overthrew a Democratic Party politician who signed the London Agreements in 1959, named Adnan Menderes. It's not Taiwan, but a crisis over a strait in this country was escalated by the USS Missouri making an appearance and was the primary inspiration for the passage of the Truman doctrine. Another leader of this nation promulgated Statism, Reformism, Nationalism and Secularism as part of his "Six Arrows" ideology. For 10 points, name this nation whose leaders have included Ismet Inonu and Mustafa Kemal Atatürk.

ANSWER: Turkey

3. This man used the sentences "Vienna is the capital of Austria" and "Trieste is no Vienna" to show the meaning of a word depends on the entire proposition it appears in. An article critical of this man's theories attacked his artificial "null-class" to hold expressions like "the present King of France." He introduced a "turnstile" symbol still used to denote derivability in his *Begriffsschrift*, and explained why a phrase like "The evening star is the morning star" was not tautological by distinguishing between the sense and reference of a denotation. For 10 points, name this German logician and author of *Foundations of Arithmetic*.

ANSWER: Gottlob Frege

4. This country's "New Wave" was inspired by a documentary short about a leper colony called *This House is Black*. A director from this country won a Palme d'Or for depicting a man who searches for others to bury him after his suicide in *A Taste of Cherry*. The immigrant family in *House of Sand and Fog* is from this country. The first film from this country to win a Best Foreign Language Film Oscar was 2011's *A Separation*. This home country of Abbas Kiarostami and Asghar Farhadi is also depicted in a French film in which Marji's uncle Anoosh is released from prison. For 10 points, name this country with strict censorship on foreign films that was depicted in a black-and-white animated film adapted from Marjane Satrapi's graphic novel *Persepolis*.

ANSWER: Islamic Republic of Iran [or Jomhuri-ye Eslami-ye Iran]

5. Martin Cubells censored an erect penis in his restoration of a painting of this scene. In another painting of this scene, two small yellow stars surround a bigger one, and the main character plants his scythe on either a rock or a cloud. In its original setting, another depiction of this scene was located opposite the artist's *Leocadia*. Rubens's version of this scene incorporates a look of horror on the smaller character as his flesh is torn. The more famous version of this scene was moved from the Quinta del Sordo to the Prado and depicts a wide-eyed, squatting, gray-haired deity holding a blood-outlined, headless character. For 10 points, name this macabre scene from Goya's *Black Paintings* of a Titan consuming one of his offspring.

ANSWER: *Saturn Devouring His Son* [or *Saturn Devouring One of His Sons*; or *Saturn Devouring His Children*; accept descriptive answers conveying equivalent information]

6. These people wore a hat that resembled a beret called the "boina," and they were separated into subgroups including the "rastreador," who traces paths, and "cantor," who was a troubadour. This people used silver straws and carried an elaborately decorated utility knife called a facon (fuh-CONE). In the 1800s, Martin Miguel de Guemes, the Governor of Salta Province, formed an army of these people to fight royalists. An example of their literature is Jose Hernandez's epic poem *Martin Fierro*. These people typically use bolas and wear ponchos, which can also be used as saddle blankets. They work as hunters and as cattle herders on ranches called *estancias*. For 10 points, name this South American cowboy primarily found in the pampas or Patagonia.

ANSWER: gauchos

7. A 1936 staging of this play was set in Haiti, called the "voodoo" version, and was directed by Orson Welles for a Harlem theater. William Macready's performance as the title character of this play was interrupted by riotous supporters of Edwin Forrest in the Astor Place Riot. A Peter Hall staging of it earned laughs when actors used real leaves to represent the trees of Birnam Wood. The title character of this play claims that life is "but a walking shadow" in a soliloquy about how "tomorrow, and tomorrow, and tomorrow creeps in this petty pace from day to day." For 10 points, name this supposedly cursed Shakespeare play commonly referred to as the "Scottish Play."

ANSWER: *Macbeth* [prompt on the "Scottish Play" until it is read]

8. The proximal third of this bone is broken in a Monteggia fracture. Like the mandible, this bone contains a triangular projection called the coronoid process. The tuberosity of this bone serves as the insertion point of the brachialis muscle, and the artery named for this bone splits into namesake anterior and posterior recurrent arteries. The nerve named for this bone can be compressed in Guyon's canal. The styloid process is on the distal end of this bone, whose proximal end terminates in a hooklike structure called the olecranon process, which articulates with the medial epicondyle of the humerus and is near the insertion point of the triceps muscle. For 10 points, name this bone on the pinky side of the forearm, which lies next to the radius.

ANSWER: ulna

9. A note about this person cites a passage of "great anthropological interest" from Ovid after describing him as "a mere spectator and not indeed a 'character'" who is "yet the most important personage in the poem." This person first speaks, "At the violet hour, when the eyes and back turn upward from the desk," and watches a "typist home at tea-time." He claims to have "foresuffered all" and "walked among the lowest of the dead" in a poem in which he sees an "Unreal City." This personage from "The Fire Sermon" describes himself as an old man with wrinkled female breasts" in a poem which ends "*Shantih shantih shantih*." For 10 points, name this narrator of much of T. S. Eliot's "The Waste Land," a gender-switching seer.

ANSWER: **Tiresias**

10. A popular method of assembling block copolymers involves them forming the multicompartiment form of these substances. Emulsion polymerization relies on the formation of these structures around an initiator molecule, and an important characteristic of these structures is measured using a decrease in the fluorescence peak wavelength of pyrene-3-carboxaldehyde. These structures form only above a point at which the third derivative of a linear function of their concentration and their monomers, with respect to the total concentration, equals zero; that point is their namesake critical concentration. Liposomes are a double-walled analogue of these structures, which phospholipids form in solution by pointing their heads out and tails in. For 10 points, name these single-layered roughly spherical particles, which form from amphipathic surfactant molecules.

ANSWER: **micelle**

11. In this poem, the Sabbath is said to ring "slowly in the pebbles of the holy streams." This poem compares a place to "a wanderer white with the dew" before stating "it was all shining, it was Adam and maiden." One figure in this poem allows the speaker to be "golden in the mercy of his means" and in the "heyday of his eyes." The speaker of this poem describes how he was "honoured among foxes and pheasants" and "famous among the barns," and it is set during "the lamb white days." The speaker claims "I sang in my chains like the sea" even though "Time held me green and dying" at the title farm. For ten points, name this poem set "when I was young and easy under the apple boughs" and written by Dylan Thomas.

ANSWER: "**Fern Hill**"

12. One commander in this war wielded a scythe sword inscribed with a runic calendar. The losing side in this war unsuccessfully presented the Twelve Articles. An insurrection at Kempton Abbey began this war, which petered out after the Battle of Pfeddersheim put an end to its "Palatine" phase. A famous mercenary from this war wore an iron prosthetic hand and was known as Gotz von Berlichingen. One side in this war was decried as "murderous thieving hordes" in an article penned by Martin Luther. The massacre of Frankenhausen was the greatest loss faced by the rebels in this war, who were commanded by the theologian Thomas Muntzer. For 10 points, name this 1524-25 war in Central Europe, in which the Swabian League crushed the namesake downtrodden social class.

ANSWER: German **Peasants'** War [or Deutscher **Bauern**krieg; or **Peasant's** Revolt; accept answers indication **peasant** conflict]

13. A type of dual-energy densitometry based on this effect is used to measure the strength of bone. A method of using this technique to measure profiles adds a term containing the z-component of momentum. One formula governing this process can be corrected for radiation pressure by multiplying by the Breit-Dirac factor. In the original experiment demonstrating this effect, the secondary peak grew as the angle was increased. The shift generated by this effect is equal to quantity one minus cosine theta times h over mc , which is why h over mc is often called this effect's namesake "wavelength". In the low-energy limit, this process becomes Thompson scattering. For 10 points, name this effect in which a photon loses energy when it bounces off an electron.

ANSWER: Compton effect [or Compton scattering]

14. This king of England partially agreed to Pope Paschal II's reforms by giving up the power of investiture, but retaining that of homage. Soon after taking the throne, he promised to end the confiscation of church property in a predecessor to the Magna Carta called the Charter of Liberties. This king married his daughter off to Holy Roman Emperor Henry V. Tragedy struck for this king when his heir, William Adelin, died in the alcohol-induced White Ship disaster; after he died, the nobility refused to accept the rule of his daughter Matilda and supported Stephen of Blois instead. For 10 points, name this king of England, a son of William the Conqueror whose death gave rise to The Anarchy.

ANSWER: Henry I, Beauclerc

15. This book sympathizes with the perpetrator of a spate of slashings in its section "The Man with the Knife." This book's title was parodied for the title of a 1976 treatise on world hunger by Franco-American activist Susan George, and was itself drawn from Rabelais's *Gargantua and Pantagruel*. The author of this book received a laudatory card reading "I have read your book, and I have come to help." As a result of this book, the Drexel Committee was organized, and a park was built in the former Five Points neighborhood. Theodore Roosevelt called the Danish immigrant who wrote this book "the best American I ever knew." It describes in detail the sweatshops and slums on the Lower East Side. For 10 points, name this photojournalistic muckracking publication by Jacob Riis.

ANSWER: How the Other Half Lives: *Studies among the Tenements of New York*

16. In the first poem in a collection, this writer joked that he had been preparing to write of weapons and wars until a god stole away a foot. This poet imitated Callimachus in writing a 644-line curse poem against a pseudonymous title character. This poet promised that "nor fire nor sword nor the devouring ages can destroy" his work in the epilogue of a poem that relates Pythagorean philosophy in its fifteenth and final book. Only six books survive of his prospective twelve-book poem explaining festivals like the Lupercalia. This poet of *Ibis* gave voice to spurned heroines in his *Heroides* and versified the Roman calendar in the *Fasti*. For 10 points, name this Latin poet of the *Metamorphoses*.

ANSWER: Ovid [or Publius Ovidius Naso]

17. The death of a self-flagellating follower of this man led crowds at a tomb to practice a "release" ritual, in which they violently beat a person undergoing convulsions. A "respectful silence" towards this man's followers was ended by the decree *Vineam Domini*. This man wrote a three-volume book with sections discussing Pelagianism and original sin; that book espoused a namesake theologian's idea of irresistible grace. Five claims from that book by him, the *Augustinus*, were denounced by the papal bull *Cum occasione*. During the formulary controversy, this theologian was supported in a text attacking Jesuit casuistry, the *Provincial Letters* of Blaise Pascal. For 10 points, name this Dutch bishop who founded a namesake breakaway Catholic sect.

ANSWER: Cornelius **Jansen**

18. This city had a gang named for dunking opponents in slaughterhouse tubs who supported the Know Nothing Party. This city was where Massachusetts militiamen and Confederate sympathizers fought the April 1861 Pratt Street Riot. A hairdresser in this city, Cipriano Ferrandini, was accused of trying to kill the President-elect. After previously walking out of the Charleston convention, Southern Democrats refused to reconvene in an 1860 convention held in this city. Rumors of a plot named for this city led to Allan Pinkerton suggesting Abraham Lincoln travel through it by night on the way to his inauguration. The first company to operate a locomotive built in America was named for this city and the Ohio River. For 10 points, name this Maryland city which was the "B" in the B&O Railroad.

ANSWER: **Baltimore**

19. Bells are introduced in the finale in proper recordings of this composer's fourth symphony, which begins with the four notes C-D-F sharp-E. The strings play an A-minor climax, and a soft bass drum roll and muted strings accompany a solo for the cor anglais, in the most famous part of this composer's Opus 22, which was conceived as the failed opera *The Building of the Boat*. The song "Be Still, My Soul" is usually sung to a hymn extracted from a brass-heavy tone poem by this composer, which was performed under several different names to skirt Russian censorship. This composer drew on his country's mythology for his *The Swan of Tuonela*. For 10 points, name this composer of the unofficial national anthem *Finlandia*.

ANSWER: Jean **Sibelius** [or Johan Julius Christian **Sibelius**]

20. This goddess asks Boreas to cease the winds so that Achilles could light the funeral pyre of Patroclus. She is responsible for carrying around a golden jug containing the water from the river Styx. In the *Aeneid*, this goddess convinces the Trojan women to set fire to the Trojan ships on Sicily. This wife of Zephyr stops Zetes and Calais from pursuing the Harpies, and she aids the birth of Apollo and Artemis by bringing Eileithyia to Delos. At the end of the *Iliad*, this goddess instructs Priam to go to the Greek camps in order to retrieve the body of Hector. Like her sisters, the Harpies, this daughter of Thaumas and Electra possesses wings. For 10 points, name this Greek messenger goddess, who is also the goddess of rainbows.

ANSWER: **Iris**

21. The radius of these things is proportional to their average effective surface brightness to the power of about negative 0.83. Using a Fourier series to fit the isophotes of these things allows them to be sorted into disky and boxy versions, and they are typically found in the red sequence of the color-magnitude diagram. One named Maffei I is found in the Zone of Avoidance while a gigantic one near Virgo emits a pair of powerful jets and is designated M87. The velocity dispersion profile of these objects, taken to the fourth power, is proportional to the luminosity according to the Faber-Jackson relation. Eight different types of these galaxies are found on the unbranched section of the Hubble tuning fork. For 10 points, name these galaxies that have an elongated shape.

ANSWER: elliptical galaxies

22. One character in this novel carries two condoms "for prevention of disease only" and frequently shows off a picture of a nude woman and a Shetland pony. In this novel, the guests at a "welcome feast" get diarrhea after a group of British men perform a musical version of Cinderella. This novel's protagonist is rescued by some ski instructors after surviving a plane crash on Sugarbush Mountain and later says "Farewell, goodbye, farewell, goodbye" before being killed by a sniper. In this novel, Edgar Derby is shot for stealing a teacup, and the main character has a child with Montana Wildhack in a zoo on the planet Tralfamadore. For 10 points, name this Kurt Vonnegut novel about a man who becomes "unstuck in time," Billy Pilgrim.

ANSWER: *Slaughterhouse-Five*

23. A hero of this state was reputed to have said "I want to create a path for freedom" before throwing himself upon an enemy pike wall to create a gap. That man, who died at the battle of Sempach, was Arnold Winkelried. After the Revolutions of 1848, Frederick William IV of Prussia allowed the city of Neuchâtel to join this country. A constitution that governed this country for five years was written by Peter Ochs. Five provinces in this country formed the Christian Union after Protestant pressure on the city of Thurgau, part of the Kappel Wars. A man who died during that war had earlier argued over the presence of Christ at the Eucharist with Martin Luther at the Colloquy of Marburg. For 10 points, name this country known at one point as the Helvetic Republic, where Huldrych Zwingli preached at Zurich.

ANSWER: Switzerland [or Swiss Confederation; or Old Swiss Confederacy; do not prompt "Helvetic Republic"]

1. This passage begins with a character singing, "How should I your true love know from another one?" For 10 points each:

[10] Name this passage, a sub-set of Act IV, Scene V from a larger play. The central character continually sings things like "hey non nonny, nonny" and hands out flowers. She is later reported to have died.

ANSWER: **Ophelia's mad** scene [or obvious equivalents]

[10] Ophelia's mad scene appears in this Shakespeare play, in which the title character asks, "to be or not to be."

ANSWER: **Hamlet**

[10] This actor, the oldest brother of Sarah Siddons, played a celebrated Hamlet in the 1780s. A performer at Drury Lane, he managed the Theatre Royal at Covent Garden and was supplanted in fame by Edmund Kean.

ANSWER: John Philip **Kemble**

2. For 10 points each, answer the following about United States involvement with Cuba.

[10] Almost 100 of the 1,300 trained Cuban anti-revolutionaries were killed in this failed 1961 invasion of Cuba at the namesake inlet.

ANSWER: **Bay of Pigs** invasion [or La **Batalla de Girón**]

[10] This 1898 declaration of Congress said that the U.S. would not seek long-term control of Cuba after the Spanish-American War.

ANSWER: **Teller** Amendment

[10] This 1901 amendment to the Cuban constitution, inserted at the behest of the U.S., bound Cuba to lease the Guantanamo base to the U.S. and avoid compromising its independence.

ANSWER: **Platt** Amendment

3. This man's unfinished Latin epic *Africa* is read by almost nobody in the scholarly establishment today. For 10 points each:

[10] Name this man who had himself crowned with a laurel wreath in Rome. Despite his huge personal classics library, he let little Greco-Roman influence into his sonnets to Laura.

ANSWER: **Petrarch** [or Francesco **Petrarca**]

[10] Petrarch first saw Laura on this day of the year, when the sky "darkened...for its Maker" according to the third sonnet of the *Canzoniere*. Dante enters Hell on this day in the *Commedia*.

ANSWER: **Good Friday**

[10] This figure is addressed at the start of all but one stanza in the 366th and last poem of the *Canzoniere*, which is emphatically not a sonnet.

ANSWER: the **Virgin** Mary [or La **Vergine**; or obvious equivalents]

4. The mathematical formulation of these objects is named for Zermelo and Fraenkel. For 10 points each:

[10] Identify these mathematical objects, usually denoted by curly brackets, which contain various numbers. The union and intersection operators act on these objects.

ANSWER: sets

[10] This set of all subsets of a set S, including the empty set and S, contains two the n elements, where n is the number of elements in the set S.

ANSWER: power set

[10] This German mathematician extended the concept of the power set to infinite sets. He showed that infinite sets that can be put into one-to-one correspondence have the same cardinality.

ANSWER: Georg Cantor

5. This woman was once accused of adultery when she left her caravan to search for a missing necklace. For 10 points each:

[10] Name this last wife of the Prophet Muhammad who, at age 18, commanded troops on the losing side of the Battle of the Camel.

ANSWER: Aisha bint Abi Bakr

[10] Aisha was the daughter of this first Caliph, who launched the Ridda wars against those subjects that refused to pay taxes.

ANSWER: Abu Bakr

[10] Like this group of people, Aisha's name is often spoken with the honorific "May Allah be pleased with her." This word refers to the companions of the prophet, which included Anas bin Maalik and the physician Harith Ibn Kalada.

ANSWER: as-Sahabah

6. Answer the following about the 2014 midterm elections, for 10 points each.

[10] This Senator, the current Senate Minority Leader, is running for re-election and was opposed by Matt Bevin in a primary race.

ANSWER: Addison Mitchell "Mitch" McConnell, Jr.

[10] This Louisiana Democrat and current chair of the Senate Committee on Energy and Natural Resources is expected to face Bill Cassidy in a close race for re-election.

ANSWER: Mary Loretta Landrieu

[10] This California billionaire, who donated heavily to Terry McAuliffe in the 2013 Virginia gubernatorial race, has pledged to spend a hundred million dollars for candidates who support climate-change legislation in the 2014 elections.

ANSWER: Thomas Fahr "Tom" Steuer

7. Sandra Mansi's photograph of this thing has been criticized for possibly depicting a tree trunk. For 10 points each:

[10] Name this thing, which is said to be a plesiosaur or other lake monster located in a body of water located partially in Quebec and partially in the American border. Tourists go to places like Plattsburgh, New York, hoping to get a peek.

ANSWER: **Champ** [prompt on the Lake **Champlain** monster]

[10] Champ is also a major draw for tourists in Burlington, a city in this state, the home of the Green Mountains.

ANSWER: **Vermont**

[10] This fort, which is on the U.S. National Register of Historic Places, is located at the northernmost point of the American part of Lake Champlain. Named for a Revolutionary War hero, it succeeded the never-finished "Fort Blunder."

ANSWER: Fort **Montgomery**

8. There is reason to believe that this man was a student of Thomas Tallis, with whom he published the *Cantiones sacrae*. For 10 points each:

[10] Name this Elizabethan English composer who included keyboard music in his *My Ladye Nevells Booke*.

ANSWER: William **Byrd**

[10] Several of Byrd's pieces referred to the notes of a hexachord as "Ut, re, mi, fa, sol, la," in a precursor to this note-labeling system in which "Ut" was replaced by "Do."

ANSWER: **solfege**

[10] Byrd wrote dozens of these often-sacred vocal compositions that emerged in the late Middle Ages. Byrd's colleague Thomas Tallis wrote one of these called *Spem in alium* for forty distinct voices.

ANSWER: **motets**

9. Answer the following about the bloodier aspects of the Civil War, for 10 points each.

[10] 5600 men lay dead across along the 800-yard long "Bloody Lane" of this 1862 battle.

ANSWER: Battle of **Antietam**

[10] Although the adjectives of the Bloody Pond and Sunken Road from this other 1862 battle may be inaccurate, a ton of people, such as Albert Sidney Johnston, still died here.

ANSWER: Battle of **Shiloh** [or Battle of **Pittsburg Landing**]

[10] This member of Quantrill's Raiders, a Confederate guerrilla known as "Bloody Bill," ordered the execution and scalping of twenty-three unarmed Union soldiers in the Centralia Massacre.

ANSWER: William T. **Anderson**

10. Louis Pasteur discovered chirality from a chemical in this good. For 10 points each:

[10] Name this good whose industry was devastated in the nineteenth century by the insect phylloxera, which was eventually defeated by breeding the European and North American varieties together.

ANSWER: wine [or grape vines; prompt on alcohol]

[10] The Methuen Treaty promoted the exchange of English wool and wine from this country. A special fortified wine named after this country is produced in the Duoro region, which is close by to Porto.

ANSWER: Kingdom of Portugal [or Portuguese Republic]

[10] After Jean-Baptiste Colbert banned the export of Bordeaux wines from France to England, this monarch began importing wines from Portugal, which may have been influenced by his Portuguese wife, Catherine of Braganza.

ANSWER: Charles II of England

11. Answer some questions about the strong force, for 10 points each.

[10] This structure, which is held together by the strong force, consists of protons and neutrons.

ANSWER: nucleus

[10] This theory of color-charged particles is used to describe the action of the strong force. According to this theory, the strong force becomes weaker as the distance decreases and the energy increases.

ANSWER: QCD [or quantum chromodynamics]

[10] These baryons, which have a spin and isospin of $3/2$, decay into a nucleon and a pion via the strong force. Their four types form an isospin quartet.

ANSWER: delta baryon

12. This molecule's concentration in the atmosphere has increased concomitant with the increase in carbon dioxide, as warmer air is able to hold more of it. For 10 points each:

[10] Identify this most abundant greenhouse gas in the atmosphere and dominant contributor to the greenhouse effect.

ANSWER: water vapor [do not accept "water"]

[10] The greenhouse effect is the absorption and re-emission of this type of radiation, which is just longer in wavelength than visible light.

ANSWER: infrared radiation [or IR]

[10] Carbon dioxide has three vibration modes, of which symmetric stretching is IR inactive and asymmetric stretching is IR active. What third vibration mode, which is degenerate, is also IR active because it causes a change in dipole moment?

ANSWER: bending vibration [prompt on change in bond angle]

13. This author included the second-person short story "Alma," whose title girlfriend discovers an Indian girl named Laxmi cheating with the reader, in *This Is How You Lose Her*. For 10 points each:

[10] Name this author and creative writing professor at MIT, who included his recurring character Yunior in his earlier collection *Drown*.

ANSWER: Junot **Díaz**

[10] Díaz, like the family in his novel *The Brief Wondrous Life of Oscar Wao*, migrated from this Caribbean country, where the Wao family incurred a curse called a *fukú* by opposing Rafael Trujillo.

ANSWER: **Dominican Republic** [or **D.R.**; or **Republica Dominicana**; do not accept "Dominica"]

[10] This author of *All Our Names* and *How to Read the Air* drew on his immigrant experience, having moved with his family from Ethiopia at age two, in a book about D.C. resident Sepha Stephanos called *The Beautiful Things That Heaven Bears*.

ANSWER: Dinaw **Mengestu**

14. This is the occupation of the title character in the movie *Sullivan's Travels*. For 10 points each:

[10] Name this occupation that in real life was held by such men as Frank Capra and John Ford.

ANSWER: movie **director** [prompt on **filmmaker**]

[10] This director of *Sullivan's Travels* specialized in directing quirky 1940s comedies, such as *The Lady Eve* and *The Palm Beach Story*.

ANSWER: Preston **Sturges** [or Edmund Preston **Biden**]

[10] In *Sullivan's Travels*, John Sullivan attempts to direct a film titled *O Brother, Where Art Thou?* Both that title and aspects of *Sullivan's Travels* were borrowed for a 2000 film by these brothers, who also made *Fargo* and *No Country for Old Men*.

ANSWER: Joel and Ethan **Coen**

15. This organelle contains a sarcin-ricin loop in its 23S component, and it uses RNA to catalyze the peptidyl-transferase reaction. For 10 points each:

[10] Name this organelle, which in eukaryotes contains a 40S and 60S component and is responsible for synthesizing proteins.

ANSWER: **ribosome**

[10] Along with the A and E sites, a site denoted by this letter exists on the large subunit of the ribosome. This site holds the growing polypeptide chain.

ANSWER: **P** site

[10] The gene encoding a ribosomal subunit can be sequenced in order to do this kind of analysis on bacteria. This technique involves sequencing all or part of every genome found in an environmental sample to assay diversity.

ANSWER: **metagenomics** [or **metagenomic** data analysis]

16. The fact that deoxygenated blood is paramagnetic is the basis for the BOLD contrast used in this procedure. For 10 points each:

[10] Name this variant of magnetic resonance imaging used specifically to measure blood flow in the brain.

ANSWER: **fMRI** [or **functional** magnetic resonance imaging; or **functional** MRI]

[10] Alzheimer's disease can be detected early by asking patients to perform this task while undergoing an fMRI. An inability to do this is prosopagnosia.

ANSWER: **facial recognition** [or **face perception**; or anything mentioning looking at a **face** or patients having **no idea what their own face looks like**]

[10] fMRI is helping research into this neurological disorder, an inability to properly order syllables on pages, which can cause reading and writing difficulties at young ages.

ANSWER: **dyslexia**

17. This civilization's literature speaks of their homeland of Dilmun, which may be modern-day Bahrain. For 10 points each:

[10] Name this first major Mesopotamian civilization that built such cities as Eridu and Lagash.

ANSWER: **Sumerian** civilization [or **Sumer**]

[10] The Sumerians developed this script, which is one of the earliest known examples of writing. This script's name comes from the wedge shapes made by reeds on clay tablets.

ANSWER: **cuneiform**

[10] This Sumerian city contained a massive ziggurat that was a shrine to the moon god Nanna, this city's patron. During the "Sumerian Renaissance" this city was led by Shulgi.

ANSWER: **Ur** [do not accept or prompt on "Uruk"]

18. This poem proclaims that "the snows of the Tyrol, the clear beer of Vienna are not very pure or true." For 10 points each:

[10] Name this poem, which begins by declaring "you do not do, you do not do." Its title character is "a man in black with a meinkampf look," who has "a stake in" his "fat black heart."

ANSWER: **"Daddy"**

[10] "Daddy" was written by this American poet who married Ted Hughes and proclaimed that "Dying is an art, like everything else" in "Lady Lazarus."

ANSWER: Sylvia **Plath**

[10] After she moved to Boston, Plath took creative writing courses attended by this fellow poet of the collections *Live or Die* and *All My Pretty Ones*.

ANSWER: Anne **Sexton**

19. A cat sniffs inside a basket in the foreground of this painting, in which angels swirl out from the smoke of an oil lamp that illuminates the scene alongside a halo. For 10 points each:

[10] Name this large painting, located in the choir of San Giorgio Maggiore, in which a multitude of people sit at a long, diagonally-arranged table.

ANSWER: The *Last Supper*

[10] This Venetian protege of Titian, whose father was a dyer, painted the aforementioned rendition of *The Last Supper*.

ANSWER: Tintoretto [or Jacopo Comin; or Jacopo Robusti; or Il Furioso]

[10] Bigger still than *The Last Supper* is this Tintoretto painting, often said to be the largest ever committed to canvas, which was completed with the help of his son Domenico. Viewed from afar, the throngs of people in this incredibly crowded painting look like waves.

ANSWER: Paradise

20. A Spanish galleon that wrecked at Stadbroke Island became part of this myth system's oral tradition. For 10 points each:

[10] Identify this myth system found in Australia, whose Rainbow Serpent may have actually been named by Alfred Radcliffe Brown.

ANSWER: Australian Aboriginal mythology

[10] The Rainbow Serpent lives in places containing this substance, also the habitat of bunyips. A billabong contains this substance for only part of the year.

ANSWER: water

[10] Aboriginals navigate parts of Australia with these oral retellings of the paths taken by gods during the creation of the universe, which is called the Dreaming.

ANSWER: songlines [or dreaming tracks]

21. Identify the following about the namesake of the most boring comet, Edmond Halley, for 10 points each.

[10] Halley's calculations of the comet probably relied on the work of this fellow scientist, who built the first reflecting telescope. Halley also persuaded this man to publish the *Principia*.

ANSWER: Sir Isaac Newton

[10] Halley used a method developed by James Gregory to calculate the sun's mean parallax. The method involved observations of these events, which occur in pairs of 8 years followed by 121 year gaps.

ANSWER: transits of Venus

[10] This man is said to have observed the transit of Venus in 1032, though you may better know this Persian for writing *The Canon of Medicine*.

ANSWER: Abu Ali al-Husayn ibn Abd Allah ibn Sina [or Avicenna]