

Tossups

1. Mikhail Ostrogradsky gets credit in Eastern Europe for its discovery, which he applied to heat flow. Analogous to the Fundamental Theorem of Calculus, it says that the integral over a closed surface of the unit normal vector dotted with a vector field  $F$  is the volume integral of  $\text{div} F$ . For ten points, name this theorem, used by Gauss to study inverse-square laws.

A. Divergence Theorem (accept Gauss' Theorem before last clause)

2. A rainbow sits above the title in the upper left. Below are a sleeping dog and an octahedral object. A frustrated angelic draftsman stares at the rainbow, sitting under a numerical array that contains the year -- 1415 -- of what engraving by Albrecht Durer?

A. Melencolia I

3. "New Youth", edited by Ch'en Tu-hsiu, had been promoting an updated view of Chinese literature and society for four years. The spark occurred when 3000 students rallied to oppose the decision of the Versailles Conference to transfer the German part of Shantung Province to Japan. Within a month, the Cabinet had resigned and China was refusing to sign the treaty with Germany. Within a few years, women's liberation was spreading throughout China, the Kuomintang was revitalized and the Chinese Communist party was begun. For ten points, name this intellectual revolution, started at that early 1919 rally.

A. May 4th Movement

4. The tenth puts the poet Gallus in an idyllic world. The first and ninth lament the expulsion of shepherds from their homes. The fifth is on the death of Daphnis, shepherd king of Arcadia. The fourth has been variously interpreted as about a child of Antony and Octavia, or a 40 BC prophecy of the birth of Christ. For ten points, name this collection by Virgil.

A. Bucolics or Eclogues

5. The culprit is an excess of an amino acid: the body is unable to convert the acid to tyrosine, leading to nervous system damage, retardation and seizures, and to a relative lack of melanin, paleness and blue eyes. Until adolescence the condition must be treated by a diet low in protein. For ten points, name this condition appearing in infants before their first year, caused by excess phenylalanine.

A. Phenylketonuria or PKU

6. Romania and Yugoslavia objected to the guarantees given to minority groups, but eventually signed. It gave independence to Poland, Czechoslovakia and Hungary. Austria lost 75% of its land and 80% of its population. The Austrian navy was reduced to four inland patrol boats. For ten points, name this treaty, which also forbids any future

German-Austrian alliance after World War I.

A. Treaty of St. Germain

\*\*\*\*\* TOO HARD \*\*\*\*\*

7. Surface water motion between 20 and 40 degrees away from the wind direction is observed in the first several fathoms of ocean water. Produced by the balance of wind stress, friction, and the Coriolis effect, it's magnitude varies with wind strength and direction, causing convergence and divergence zones in the water which lead to upwelling and downwelling. For ten points, name this phenomenon partially responsible for the nutrient-poor Sargasso Sea, first analyzed by a Swedish oceanographer.

A. Ekman transport

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8. Newton confirmed it to within 1 part in a thousand using pendulum-based experiments. It was shown for Earth within one part per billion by Roland, Baron von Eotvos in the early 1900's. In the 1960's it was confirmed for the Sun's influence on gold and aluminum. For ten points, name this central idea of geometric theories of gravity, asserting that gravitational mass and inertial mass are the same.

A. Principal of Equivalence

9. While fighting for Egypt in the 1948 war with Israel he decided that corruption was hurting the Egyptian military. He formed a secret group called the Free Officers and pushed for reform. In 1952 the Free Officers led the revolt against King Faruk and he was installed as prime minister. For ten points, name this general, forced into retirement in 1954 by Gamal Abdel Nasser.

A. Mohammed Naguib

\*\*\*\*\*CHANGE\*\*\*\*\*

10. Dopey Lekisch, Zeinvel Ninny, Treitel Fool, Sender Donkey, Shmendrick Numskull, and Feivel Thickwit are the town elders, and their leader is Gronam Ox. They rename water to alleviate a sour cream shortage, sentence a carp to death by drowning, and prohibit the importation of goats from a nearby town to keep them from changing sex. For ten points, what is this town of fools, the basis of several stories by Isaac Bashevis Singer?

A. Chelm

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11. It is an area separated from the surrounding country by defined boundaries, possibly with a different administration and legal system. Examples included English settlements in Ireland and a medieval section of Calais. For ten points, name these regions, the best known of which were Jewish settlements in the Russian Empire.

A. the pale

12. Ethers are useful for extraction of organic compounds because they easily form these sorts of mixtures with them. Fractional

distillation is useless for separating these because the components' proportions don't change. For ten points, name these mixtures characterized by having the same compositions in liquid or vapor form.

A. \_azeotropes\_

13. Sometimes explaining the exceptions to one law creates another. When the accent does not fall on the root syllable of the Sanskrit cognate, p (PEE) becomes b (BEE), for example. When it does fall on the root, Grimm's Law is valid and it becomes f (EFF). For ten points, what is this correction to the most famous of the linguistic sound laws?

A. \_Verner's Law.\_

\*\*\*Change -- reorder\*\*\*

14. He wrote "St. Patrick's Day; or, The Scheming Lieutenant" to show his appreciation for Lawrence Clinch, who got him out of a jam by performing brilliantly in the lead role in "The Rivals" with no prep time and from a totally rewritten script. He was manager of the Drury Lane Theater, where he was labelled "a modern Congreve". After entering politics, his powers declined to the execrable late melodrama "Pizarro". For ten points, name this Whig MP, best known for his satirical work "The School for Scandal".

A. Richard Brinsley \_Sheridan\_

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\*\*\*\*\*Change to GHOSTS\*\*\*\*\*

15. His widow is of a conventional mindset, so the memorial to him can't really be honest. His daughter is slowly sucked into the life of a prostitute, while his son goes mad from the syphilis passed on to him. Eventually the memorial burns down. For ten points, name this restless spirit, motivator of Henrik Ibsen's \_Ghosts\_.

A. Captain \_Alving\_

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\*\*\*Change to Hiawatha\*\*\*

16. He was a strong, handsome warrior, who wished the tribes to live in peace under the rule of law. Called Peacemaker, he converted a cannibal and making him his follower. The cannibal failed in his attempt to convert the Onondaga, and Peacemaker bolstered his commitment by creating the Requickening Address. For ten points, name this founder of the Iroquois League, and mentor of Hiawatha.

A. \_Deganawidah\_ (or Dekanawidah)

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17. "The Chapters of Coming-Forth-by-Day" were published in an 1842 collection of Karl Lepsius. The 200 known chapters include the Coffin Texts, composed of spells painted on tombs between 2100 and 1600 BC, and the Pyramid Texts, which are mortuary prayers from about the same period. For ten points, give the more common name of this collection of ancient Egyptian death rituals.

A. \_Book\_of\_the\_Dead\_

\*\*\*\*Tsushima? Problem\*\*\*\*

18. First opened to Western trade in 1568, it was the only city foreigners could visit during the Tokugawa period, and even that was grudging: the Dutch were allowed to dock one ship per year there. Located on western Kyushu, it is the closest port to mainland China. For ten points, name this Japanese city, site of mass destruction on August 9, 1945.

A. Nagasaki  
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19. In the choral piece "Jehovah quam multi sunt hostes mei" he used the revolt of Absalom against David as a metaphor for the political trouble caused by the protestant Duke of Monmouth for his father Charles II. He died before finishing an opera based on Dryden's the Indian Queen, having managed to keep his official positions in Westminster under William and Mary. For ten points, name this Restoration composer, well-known for works such as "The Fairy Queen" and "Dido and Aeneas".

A. Henry Purcell

20. The strongest leader in Britain after the departure of Roman government, he had to deal with constant raids by the Picts and the Scots. In an effort to guard the kingdom, he allowed the Jutes to establish garrisons in Kent. This turned out to be a mistake, leading to war, the death of his son, and the Jutes obtaining control of Essex and Sussex. For ten points, name this ill-starred 5th century King.

A. Vortigern (accept Wyrhtgeorn)

Bonuses

1. Answer the following about a pivotal event of the 30 Years War, for TSNOP.

[10] On Nov. 16, 1632, the Swedes and North Germans met the forces of Emperor Ferdinand II. By the end of the battle, Gustavus Adolphus was dead, having been surprised in the fog while out with a small scouting group. For ten points, name the battle.

A. Lutzen

[20] Gustavus Adolphus attacked because he received word that the imperial commander had sent part of his army on another mission. When the King of the Swedes was killed, his army rallied and would have destroyed the imperial forces, but the man in charge of the detachment returned just in time to allow a retreat. For ten points each, name the imperial commander and the man leading the detachment.

A. Albrecht von Wallenstein and Gottfried Heinrich, Graf zu Pappenheim, respectively.

2. Answer the following about sunspots for ten points apiece.

[10] This is the dark central core of a sunspot, where the magnetic fields responsible for spots come vertically out of the Sun's surface.

A. Umbra

[10] Apparently there were very few sunspots seen between 1645 and 1715. Since this falls right in the middle of the Little Ice Age, some researchers suspect a correlation between the cold weather in Europe and this period of relative sunspot inactivity, which is called what?

A. the Maunder minimum

[10] The outer half of the penumbra exhibits horizontal outward flow of magnetic features at the rate of 1 km/sec. These features flow out into the area around the spot, and there is a reverse flow in the chromosphere of material being sucked into the spot. Name this effect.

A. Evershed effect

3. Answer the following about early Rome for ten points each.

[10] Because there were few women in Rome, Romulus took young women by force from this group during a festival he threw to lure the tribe in. Name the offended people.

A. Sabines

[10] The Sabines became enemies of Rome, but this daughter of a Roman governor just couldn't help admiring their shiny bracelets. She agreed to let the Sabine warriors into the citadel in exchange for what was on their left arms. Name her.

A. Tarpeia

[10] Tarpeia was killed by the Sabines for her troubles. How did they kill her in a way that let them keep their bargain?

A. They crushed her with their shields, which were also worn on their left arms.

4. 30-20-10, multitalented European.

[30] He led the first team to cross Greenland from east to west, and in 1895 he and Hjulmar Johansen came within 300 miles of the North Pole.

[20] He served as ambassador to Great Britain from 1906 to 1908, after instrumental work negotiating the 1905 treaty of separation between Norway and Sweden.

[10] He was Norwegian delegate to the League of Nations after World War I and directed the return of German and Russian war prisoners to their homelands. He received the 1922 Nobel Peace Prize.

A. Fridtjof Nansen

5. Answer the following about a small country.

[10] A California bottler has begun manufacturing a Pinot under a label explicitly imitating the famed Pinot of this Duchy, hurting the carefully balanced economy of the country. For ten points, name the Duchy, the subject of The Mouse that Roared.

A. The Duchy of Grand Fenwick

[10] The Prime Minister decides that the way to revitalize the depressed economy of Grand Fenwick is to go to war with the US, lose, and be the recipient of a new Marshall Plan. Identify the Prime Minister who hatches this master scheme.

A. Count of Mountjoy

[10] The Fenwickian strike force in New York accidentally defeats the United States when they capture what doomsday weapon based on a mythical isotope of hydrogen with three neutrons in its nucleus?

A. quadium bomb

\*\*\*\*TOO HARD\*\*\*\*

6. Identify these philosophers for fifteen points each.

[15] His "Conceptscript" of 1879 presented the first modern logical system, and he applied it in the 1884 book Foundations of Arithmetic. In his work is the first clear distinction between the form of a logical law and its semantic interpretation. His work was greatly admired by the young Bertrand Russell, who unfortunately uncovered a paradox in his system.

A. Gottlob Frege

[15] He took one of the best stabs at turning philosophy into mathematics with his development of modal logic, which has some ability to rigorize such vague concepts such as perception, belief, or obligation. He noted that identity sentences come in two forms -- a priori (Venus is Venus), which are trivial, and a posteriori (the morning star is the evening star), which require empirical testing.

A. Saul Kripke

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7. How much do you know about neurotransmitters? For ten points each:

[10] This transmitter is stored in vesicles at nerve endings. A vasodilator, it slows the heartbeat and increases bladder pressure. It also affects memory and is in short supply in Alzheimer's victims.

A. acetylcholine

[10] Derived from tryptophan, this strong vasoconstrictor is a component of wasp venom. It is concentrated in the midbrain and hypothalamus. Reduced levels can cause depression.

A. serotonin (or 5-hydroxytryptamine)

[10] Another constrictor, release of this is provoked by the use of amphetamines and ephedrine, producing effects that mimic the sympathetic nerves. The effect is halted when vesicles recapture the

transmitter.

A. norepinephrine (or noradrenaline)

8. You are playing the board game Clue -- in Russian. When informing us that the solution is "Mr. Coon killed him with the buzzer system, in the Library?" you use several noun cases. For ten points each, which case do you use for

[10] "Mr. Coon" Answer: nominative  
[10] "buzzer system" Answer: instrumental  
[10] "Library" Answer: locative

9. Answer the following about discoveries in physical anthropology for ten points each.

[10] The earliest evidence of bipedal locomotion was footprints in volcanic ash found in 1975 at this site near Olduvai Gorge. Also found were 13 jawbone fragments dating back 3.6 million years. Name the site.

A. Laetoli (accept Garusi, an older name)

[10] For ten points, the Laetolil remains were found by what famous Olduvai researcher?

A. Mary Leakey

[10] Resemblance of these remains to those found at the Hadar site in the Middle East led Donald Johansen to suggest that they were the same species. For five points per word, give the scientific name for this species.

A. Australopithicus afarensis

10. Got rocks in your head? Let's find out:

[10] A flow of incandescent ash and gas heated to 1300 degrees and moving at 100 mph is something people living near Mt. Pele'e learn to get out of the way of. For ten points, give the geologic term for this volcanic event, French for "fiery cloud".

A. nue'e ardente

[10] After the trouble passes, the ash frequently hardens into this pyroclastic rock, specifically that sort which is formed from a fragment size under 2 millimeters.

A. tuff

[10] If the fiery cloud didn't get you, the bombs and blocks probably did. Name the rock formed from the collection of these fragments, which are bigger than 64 millimeters wide, also called agglomerate.

A. pyroclastic breccia

11. Accepted by Roman Catholics, accepted by Eastern Orthodoxy, both, all Christians, or nobody? Place the following past or present Old Testament works in the appropriate categories.

Baruch	Answer: Roman Catholics
Judith	Answer: both
3rd Maccabees	Answer: nobody
Tobit	Answer: both
1st Esdras	Answer: nobody
Nahum	Answer: all Christians

12. 30-20-10-5 Russian author

[30] He wrote a poetic folk tale titled "A Song About Tsar Ivan Vasilyevich, His Young Bodyguard, and the Valiant Merchant Kalashnikov."

[20] Byron had a great influence over him, which shows in such works as "The Demon" and "Prisoner of the Caucasus", written in the Byronic style.

[10] He is best known for a work about the "hero" Pechorin, whose cynicism and lack of challenge lead him to play manipulation games with the people around him.

[5] Pechorin is the protagonist of "A Hero of Our Time".

A. Mikhail Lermontov

13. Can you follow procedure? Then identify these algorithms important in mathematics.

\*\*\*PROBLEM\*\*\*

[10] If this algorithm works in a ring, then for any elements  $a$  and  $b$ , there are elements  $q$  and  $r$  such that  $a = q*b + r$ . It is used in ordinary arithmetic to find the greatest common divisor of two numbers.

A. Euclidean Algorithm  
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[10] To find a solution, first make a good guess. Evaluate the function at your guess and find the line tangent to the graph of the function there. Find the intersection of that tangent line with the x-axis. This is your second guess. Repeat.

A. Newton's Method

[10] If you want to find the maximum value of a function subject to many inequality constraints, find an extremum, check if it's optimal, and if it's not, move along an edge to another extremum, picking the edge that increases the function as fast as possible. This is a key technique of linear programming.

A. Simplex method

14 Identify these stringed instruments for ten points each.



[10] This is a neckless instrument whose strings are stretched across a shallow soundbox. Types include psalteries and dulcimers, and they can be bowed or plucked. The sitar is a descendant.

A. \_zither\_

[10] This Russian instrument has a triangular belly and comes in sizes from piccolo to double bass. This folk instrument is normally plucked.

A. \_balalaika\_

[10] This is a shortened fiddle that doesn't use a bow. Instead a wheel with rosin on the rim turns at the end, and the notes are played by pressing keys. There are also unkeyed drone strings called bourdons.

A. \_Hurdy-gurdy\_

15. Identify these US political parties from some of their presidential candidates. Five points per party.

Benjamin Butler (1884), James B. Weaver (1880)

A. \_Greenbacks\_

\*\*\*\*FIND ANOTHER DUDE\*\*\*\*

Also Benjamin Butler in 1884

A. \_Anti-Monopoly\_

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James B. Weaver (1892), William Jennings Bryan (1896)

A. \_Populists\_

Victoria Woodhull (1872), Belva Ann Lockwood (1888)

A. \_Equal Rights\_ Party

Strom Thurmond (1948)

A. \_States' Rights\_ or \_Dixiecrats\_

Benjamin Spock (1972)

A. \_People's\_ Party

16. Answer the following about the history of an African people.

[10] This warrior and king introduced close combat with stabbing spears and worked to exterminate or assimilate all rival clans. His people were among the smallest groups when he started, but by the 1820's they had smashed the clan system and ruled Natal. Name the leader.

A. \_Shaka\_

[10] Shaka became unstable in 1827 and killed 7000 of his own people. No crops were planted that year, and milk was not allowed to anyone. All pregnant women and their husbands were slain. What was the cause of Shaka's psychotic episode?

A. the death of Shaka's mother, Nandi. (accept equivalents)

[10] Shaka was assassinated in September, 1828, by his half-brother, who took the throne. Name him.

A. Dingane

17. [5] In 1953 the Nobel Prize committee awarded the Literature prize to a politician. First, for five points, name him.

A. Winston Churchill

[5] Now name the four-volume work published after his Nobel award, an ambitious retelling of a major part of Western history.

A. A History of the English-Speaking Peoples

[10] One of his earliest works was based on notes from his tour of duty in India's North-West Frontier. Name this work, a major success in England.

A. The Story of the Malakand Field Force

[10] In 1898 he wrote a romance in the style and locale of Hope's The Prisoner of Zenda. Name this modest novel.

A. Savrola

18. Answer the following about a classical work.

[10] Only about one-tenth of the work remains, and the style varies between episodes, from realism to mockingly literary. Written by Nero's director of elegance, it got the author into trouble by appearing to portray the Emperor as a maudlin, tasteless twit. For five points per part points, name both the work, containing the piece "Widow of Ephesus" and its author.

A. Satyricon and Gaius Petronius Arbiter (accept Titus Petronius Niger)

[20] Now, for ten points each, name the narrator of the Satyricon, and the boorish banquet host meant to parody Nero.

Encolpius (narrator) and Trimalchio (boor)

19. Nations come and go. Identify the following.

[10] It was an autonomous principality of the Ottoman Empire in the 16th and 17th centuries. It played the Turks against the Habsburgs while trying to stay independent, and was ruled by the Bathory dynasty. Today it is part of Romania.

A. Transylvania

[10] Drained by the Yenisey river, the capital is Kyzyl. It was independent from 1921 to 1944, but has been a province or autonomous Russian republic ever since.

A. Tannu Tuva

[10] Surrounded by Nepal to the west, Bhutan to the east, Tibet to the north and West Bengal State to the south, in 1970 it held a referendum on merging with India, approved by 97% of the electorate.

A. Sikkim

\*\*\*JUST PLAIN BAD\*\*\*

20. Given an element, give the electron configuration, for the stated number of points.

[5] Beryllium

A.  $1s^2-2s^2$

[5] Nitrogen

A.  $1s^2-2s^2-2p^3$

[10] Sulfur

A.  $1s^2-2s^2-2p^6-3s^2-3p^4$

[10] Bromine

A.  $1s^2-2s^2-2p^6-3s^2-3p^6-4s^2-3d^{10}-4p^6$

\*\*\*MAN, THIS SUCKS\*\*\*