NEW TRIER SCOBOL SOLO 2011
ROUND 13
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1. Most computer programs use Homer's rule to evaluate expressions of this form. Varieties, the central object of study in algebraic geometry, are defined to be the set of solutions to a system of these objects. One type of these named after Vaughan Jones and another named after James Alexander and John Conway are used to represent knots. Descartes' rule of signs is a method for determining the number of roots for one these, and these can be differentiated using the power and sum rules. Niels Abel (AH-bul) proved that formulas do not exist to find roots for these when they are at least fifth degree after Lodovico Ferrari and Gerolamo Cardano found a formula for the quartic type. Give the name for these expressions, examples of which are $3xy$ and $x+2y$.
ANSWER: **polynomial**s [or **polynomial** expressions; accept **polynomial** equations]

2. By winning a Supreme Court case, this organization won the right for fertile women to work with hazardous levels of lead at Johnson Controls, Inc. A disagreement over whether this organization should be led by Francis Dillon or Homer Martin played a major role in breaking off the CIO from the AFL, and Walter Reuther (ROO-thur) led this organization for twenty-four years before bringing back the AFL-CIO merger. Reuther had earlier received a severe beating during the Battle of the Overpass. Michael Moore's relatives worked for this union, which led to him making *Roger & Me*. Name this union whose first major action was the Flint Sit-Down Strike against General Motors.
ANSWER: **U**nited **A**uto **W**orkers [or The International Union, **United Automobile, Aerospace and Agricultural Implement Workers** of America]

3. The first complete map of one of these structures was published in 2009 for *Listeria*, while the activity of another can be detected by a blue color in the presence of X-gal. The discovery of these structures in *C. elegans* ended the longstanding belief that they were confined to prokaryotes, and the work of Jacob and Monod found that their function depends on an upstream regulatory gene. The sugar arabinose (uh-RAAB-ih-nohs) acts as an inducer for one of these genetic structures, while tryptophan serves as a corepressor for another, preventing the attachment of RNA polymerase (pah-LIH-mur-"ace"). Consisting of structural genes, a promoter, and an operator, name these transcriptional units of the bacterial genome such as *E.coli*'s *trp* and *lac* ones.
ANSWER: **operon** [do not prompt on "gene"; do not accept more specific answers]

4. In one play by this writer, Sir William wants to teach his nephew a lesson by having him arrested and seeing who comes to his defense. In addition to that work about Mr. Honeywood, this author wrote another play which begins with a wife complaining that the most interesting visitors she gets are Cripplegate and Mrs. Oddfish. Her daughter Kate later pretends to be a maid to attract Charles Marlow. In a novel by this author, Moses disappoints his family by bringing home green spectacles, and Arabella Wilmot's father calls off her wedding to George Primrose. Name this author of *The Good-Natured Man*, *She Stoops to Conquer*, and *The Vicar of Wakefield*.
ANSWER: Oliver **Goldsmith**

5. Some people in this country have labeled two of the days this year as Friday of Glory and Friday of the Free Army. This country is accused of using Mohamad Soueid to spy on its dissidents in the United States. Some of the opposition in this country belongs to the Yakiti Party, while the President is a member of the Alawite sect of Shia Islam. Opposition leaders are hopeful that the new Constitution will eliminate a law passed after the Corrective Revolution that puts this country under the control of the Ba'ath Party. At least three thousand protesters have been killed here this year, and their main demands are increased freedoms and the resignation of Bashar al-Assad. Name this country which has seen protests in cities such as Hama, Homs, and Damascus.
ANSWER: **Syria**n Arab Republic [or Al-Jumhuriyyah al-'Arabiyyah as-**Suriyyah**]

6. This person at one point ordered the arrest of Pierre Broussel during a series of political disputes, but he rescinded that order when it became very unpopular. One result of the negotiations between this person and Don Luis de Haro was the marriage of this person's monarch with Maria Theresa of Spain. That deal was part of the Treaty of the Pyrenees. The popular rebellions against this person were called Frondes (fronds), though he stayed in power until his death in 1661. Name this Chief Minister of France who negotiated the Peace of Westphalia that ended the Thirty Years' War, served under Louis the Fourteenth, and succeeded Cardinal Richelieu.
ANSWER: Cardinal Giulio "Jules" Raimondo **Mazarin** [accept **Mazzarino**; accept **Mazarini**]

7. Barbiturates are produced by reacting this substance with malonic (muh-LOH-nik) esters, and plywood is made with a resin of this substance and formaldehyde. Arginase (AHR-juh-neys) catalyzes the formation of this substance in the ornithine (OR-nih-theen) cycle, and a BUN test measures its concentration in the blood. The vitalism theory was disproven when Friedrich Wohler synthesized this molecule from ammonium cyanate, and in mammals this is the major nitrogenous (nai-TRAH-jih-nuhs) waste product of protein metabolism. Consisting of two amine (uh-MEEN) groups bonded to a carbonyl (kar-BAH-nil), name this molecule formed in the liver, filtered by the kidney, and passed out of the body in the urine.
ANSWER: **urea** [accept **carbamide**; do not accept "urine"]

8. One story told by this poet supposedly comes from a cat chained to a green oak tree, who tells the story of a prince rescuing his bride from a wizard. Another work by this poet is about a man who falls asleep during a flood, waking up in front of a famous statue which later becomes alive. Another work by this poet begins with the title character hoping his uncle will die so he can get the inheritance; that character meets the Larina (lah-REE-nah) sisters after befriending the young poet Vladimir Lensky. Name this poet who often wrote about St. Petersburg, the author of *Ruslan and Ludmila*, *The Bronze Horseman*, and *Eugene Onegin* (o-NAY-gin).
ANSWER: Alexander **Pushkin**

9. In the second movement of the first of these musical pieces, the bassoon plays a loud bass note that is often compared to a fart, and the eleventh of these pieces begins with a long drumroll. During the premier of one of these twelve pieces, a chandelier fell from the ceiling, but nobody was hurt. The pieces were in reaction to two trips funded by Johann Peter Salomon, who traveled with the composer in the 1790s. Because of distinctive second movements, one of them is nicknamed *Military*, while another is nicknamed *Clock*. Identify these works that include the *Surprise Symphony*, the last symphonies composed by Joseph Haydn.
ANSWER: Haydn's **London** symphonies [accept **Salomon** symphonies before Salomon is mentioned]

10. One representative of this belief system wrote *On the Happy Life*, which stated that we should let virtue go first and not surrender to pleasure, in addition to *On the Shortness of Life*. Another leader of this school of thought, who said that people walk in wickedness all their lives, was Cleanthes (clee-AN-thees), who came centuries before Epictetus (ep-ik-TEE-tuhs) and Seneca. The founder of this school, who said, "Happiness is a good flow of life," was Zeno of Citium. Identify this philosophical school whose name, derived from the porch where the philosophers met, now refers to people who can endure hardship without complaint.
ANSWER: **stoic**ism [accept word forms]

11. This Roman favored Hyrcanus II over Aristobulus II during an invasion of Jerusalem that took place shortly after this man cleared up the Mediterranean by defeating the Cilician pirates. This leader also replaced Lucullus in the Third Mithridatic War, successfully gaining control of Pontus. After Crassus defeated Spartacus, this person captured Spartacus' remaining troops and took credit for finishing off the revolt. This leader was married to Julia, the daughter of Julius Caesar, but Caesar defeated him and his Optimates at the Battle of Pharsalus. Shortly after that, Ptolemy XIII sent this man's severed head to Caesar. Name this leader who joined with Crassus and Caesar to form the First Triumvirate.
ANSWER: **Pompey** the Great [accept Gnaeus **Pompieius** Magnus]

12. One novel by this author is about Urania Cabral and her relationship with Dominican Republic dictator Rafael Trujillo [troo-HEE-yoh]. Another historical work by this author is about Antônio Conselheiro, who believed that the end of monarchy would bring the Antichrist and who founded the village of Canudos. In addition to *The Feast of the Goat* and *The War of the End of the World*, this writer wrote about a man who marries his uncle's sister-in-law and works at a radio station with Pedro Camacho. Name this 2010 Nobel Laureate in Literature, the Peruvian author of *Aunt Julia and the Scriptwriter*.
ANSWER: Mario **Vargas Llosa** [prompt on a partial last name]

13. The square of this quantity is used in the denominator of classical calculations of kurtosis, which is supposed to measure the peakedness of a distribution, and this quantity is known as the second moment about the mean. In a Poisson (pwah-SOHN) distribution, this quantity is equal to the mean. For a set of numbers, this quantity is equal to the expected value of the squares of the numbers minus the square of the expected values. If all of the numbers in a list are multiplied by a constant, this quantity gets multiplied by that factor squared. Name this quantity, the average of the squares of the deviations, whose square root equals the standard deviation.
ANSWER: sample **variance** [accept **second moment** or **second cumulant** before "moment"; do not accept or prompt on word forms]

14. This person's support of Patrick Cranstoun and Andrew Armstrong led to criticism of him by William Maitland and James Stewart, the Earl of Moray. This person wrote a history book that included the complete text of the Treaty of Berwick and which described the movement he led. He played a major role in starting a church known as The Kirk, and he also helped write a *Book of Discipline* and *Book of Common Prayer*. Several of his major successes, including passage of a law forbidding the celebration of mass, took place in 1560, a few years before he convinced the queen not to marry the son of Philip II of Spain. Name this author of *History of the Reformation in Scotland*, generally considered the founder of Presbyterianism.
ANSWER: John **Knox**

15. Lithium fluoride has the largest hydration value of this quantity of any halide (HAL-"ide") salt, and the energy calculated by the Born-Haber cycle is also called the lattice type of this. When the temperature and equilibrium constants are known, the change in this quantity can be found using the van't Hoff equation. For a closed system, this quantity is equal to internal energy plus pressure times volume, and the change in this quantity for each step of a reaction can be summed to find the total change by Hess' law. Indicating an exothermic reaction when its change is negative, name this thermodynamic quantity symbolized H and used to determine the heat content of a system.
ANSWER: **enthalpy** [do not accept or prompt on "heat"; do not accept or prompt on "heat content"]

16. The protagonist of this novel saw a lynching when he was a child in Ohio. At Gaylord's, that protagonist befriends a *Pravda* journalist named Karkov who later intervenes when Andrés is arrested. The protagonist of this novel leaves his job as a college language professor and is guided by Anselmo to a group led by Pablo and his wife Pilar. He is assigned by General Golz the job of blowing up a bridge to help the Republicans in the Spanish Civil War. Name this novel about Robert Jordan, written by Ernest Hemingway, which takes its title from the poetry of John Donne.
ANSWER: *For Whom the Bell Tolls*

17. A painting by this artist in which the table surface appears curved and slanted and the statue is missing its arms is *Still life with Plaster Cupid*, and he showed his sister playing piano in *The Overture to Tannhauser*. Near the end of his life, this artist painted works such as *Three Skulls on a Rug* and *Pyramid of Skulls*. Picasso said this artist was "like the father of us all." During the 1890s, he painted a series, often with the man on the left smoking a white pipe, of men seated at tables playing cards. Name this French Post-Impressionist who often portrayed Mount Sainte-Victoire (sayn vik-TWAR).
ANSWER: Paul **Cézanne**

18. This leader had his sons tutored by Faizi, and for some time his head advisor was Faizi's brother Abu'l-Fazl ibn Mubarak. He received religious advice from Salim Chishti and started a religion based on Shi'a Islam. This leader also instituted a system using mansabdars to rule regions in his name, and he eliminated pilgrimage taxes and the jizya, which was another tax on non-muslims. This leader's only son to survive to adulthood, who tried to replace him in 1600, was Jahangir (juh-HAHN-geer). Name this leader who replaced Humayun (hoo-MAH-yoon) to become the third Mughal Emperor.
ANSWER: Abu'l Fath Jalal ud-din Muhammad **Akbar** the Great

19. In his most famous paper, this man rejected the caloric theory of Carnot (kahr-NOH) and Clapeyron (cla-pay-ron) on theological grounds. For ideal gases, an increase in volume that performs no work produces no temperature change by his namesake expansion. Lord Kelvin developed the absolute temperature scale in part to better test this man's ideas, and together the two scientists name an effect by which the temperature of gas changes as it is throttled. His best known experiment used ropes to transmit kinetic energy from masses to a sealed vat of water, and his key work is titled *On the mechanical equivalent of heat*. The unit named after this person is based on a force of one Newton acting for one meter. Name this physicist who was the first to explicitly state the law of conservation of energy and consequently has the SI unit of work and energy named for him.
ANSWER: James Prescott **Joule**

20. This opera contains the song "Dite alla giovine" (DEE-tay al-la jho-VEE-nay), in which the main character agrees to break off her relationship with the son of Giorgio. It also contains the love song *Un dì, felice, eterea* (oon dee, fay-LEE-chay, eh-tay-RAY-uh) and the drinking song "Libiamo ne' lieti calici" (leeb-YAH-moh nay LYET-ee kah-LEE-chee). This work begins with Gastone (gah-STOHN-ay) encouraging a relationship between his friend Alfredo Germont and the main character Violetta Valéry, who, like *La bohème*'s Mimi, has consumption. Name this opera by Giuseppe Verdi whose title can be translated as *The Fallen Woman*.
ANSWER: La **Traviata** [accept The **Fallen Woman** before the end]

TB1. S. S. Goldich used this construct to predict rates of dissolution, and in one section of this, materials consistently transition to an albitic phase. This construct predicts the unusually high melting point of peridot, and the trend on one side is for calcium-rich plagioclase to become sodium-rich. The higher silicate content of granite compared to basalt is explained by this diagram, which links pyroxene to amphibole to biotite before ending with the felsic rocks and quartz. Containing continuous and discontinuous branches, name this Y-shaped diagram that shows how the mineral composition of magma changes as it cools.
ANSWER: **Bowen**'s **reaction series**

TB2. For over twenty years, this school employed the sociologist who said, "If men define situations as real, they are real in their consequences", Wiliam Isaac Thomas. This school's faculty also included social psychologist George Herbert Mead, who became attached to the phrase "symbolic interactionism". The economist who wrote *Risk Uncertainty and Profit*, Frank Knight, also taught at this school. Teachers at this university such as Richard Posner and Ronald Coase have increased the amount of economic analysis in the legal field. This school is also closely associated with the authors of *A Monetary History of the United States*, Anna Schwartz and Milton Friedman. Name this school associated with eighty-five Nobel Prize winners, located in the Hyde Park neighborhood of its namesake Illinois city.
ANSWER: The University of **Chicago**

TB3. Which animal…is one of two outcomes, along with the Lady, of a Frank Stockton story; has literary examples like Shere Khan in *The Jungle Book* and Richard Parker in *Life of Pi*; and has Bengal and Siberian species known for their black stripes?
ANSWER: **tiger**