

## LIMIT 2015: A Limit to Learning is a Dangerous Thing

Written by Lexington High School (Colin Cantwell, Kyle Doney, Reggie Luo, Gavin Mak, Duncan McCallum, Arjun Sarathy, Devin Shang), Hinsdale Central High School (Ankush Bajaj, Sunny Chen, Harrison Wang, James Zhou), and Victor Pavao

Edited by Rohan Nag and Jarret Greene

### Packet 11

#### Tossups

1) **In one work by this author, the speaker chides himself “for loving, and for saying so / in whining poetry,” and he tells the addressee of another of his poems that “We’ll build in sonnets pretty rooms” and implores, “For God’s sake, hold your tongue and let me love.” This author of “The Triple Fool” and “The Canonization” wrote a poem in which the title (\*) insect “sucks me first, and now sucks thee,” and he describes the title entity of another of his works as a “slave to Fate, Chance, kings and desperate men.” For 10 points, name this British poet of “The Flea” and “Death be not proud,” one of his Holy Sonnets.**

ANSWER: John Donne <CC>

2) **This man distinguished between forms of rationality that are purposeful, affectual, and conventional as part of a larger study that would influence Talcott Parsons’ views on social action. In one work, this thinker noted how societies can transition from a focus on tradition to a focus on law as part of a larger discussion on (\*) authority and its three ideal types. This man notably wrote a work that mentions how people can be trapped in an “iron cage of rationality” and that ties the growth of capitalism to the rise of the titular faith. For 10 points, name this German sociologist of *Politics as a Vocation* and *The Protestant Ethic and the Spirit of Capitalism*.**

ANSWER: (Karl Emil) Maximilian Weber <AB>

3) **‘Park X’ used to be this city’s Greektown, but is now primarily South Asian. This city includes the largest underground area in the world, called RÉSO. The destruction of its Chinatown made space for the Guy Favreau complex and the Place du Quartier. The Francofolie festival in this city has non-jazz music, while its (\*) International Jazz Festival is the world’s largest. This island city includes Habitat 67 and McGill University, and is the second-largest in Canada. It’s not Quebec, and this city is named after Mount Royal hill in its center. For 10 points, name this second most populous Canadian city, the capital of Quebec Province.**

ANSWER: Montreal, Quebec <CC>

4) **The Indian Agency oversaw this trade. It’s not gold, but this good’s namesake Rush brought the first migrant wave to California. The Upper Country and Middle Ground were early sites of this activity, whose route lengths were measured in pipes. The “rendezvous system” saw “mountain men” get this good in the Rockies. Andrew Jackson vowed to steal this trade from (\*) Canada using the Kentucky militia. A Pacific company of this trade was made by John Jacob Astor. Coureurs de bois, or runners of the woods, traded for this good in New France. Beavers, deer, and raccoons are the sources of, for 10 points, what hairy good used for tophats and coats?**

ANSWER: fur trade; accept more specific answers before mentioned

5) **At the close of one of this man’s plays, the trumpet player Levee stabs Toledo after his shoes are stepped on, and the title character of that play insists on the stuttering Sylvester introducing a song. In another play by this man, Raynell and Cory sing a song about “Old Blue” before the funeral of their father, the garbage truck driver Troy (\*) Maxton, while in yet another play, Berniece prevents Boy Willie from selling the title instrument to purchase Sutter’s Land. For 10 points, name this playwright who included *Ma Rainey’s Black Bottom*, *Fences* and *The Piano Lessons* in his Pittsburgh Cycle about African-American life.**

ANSWER: August Wilson or Frederick August Kittel <CC/JG>

6) This nation's syncretism of two religions was called "original substance, manifest traces" and is reflected in a "dual aspect" version of its current religion. Practitioners of this nation's main religion have sacred places with hand washing basins and wooden blocks to write wishes on. This nation's main religion only has (\*) male priests and followers offer fruits rice to spirits of specific things or animals, like Inari, the spirit of foxes. This nation's religion solidified in the Honji-sui-jaku during its Heian period. For 10 points, name this nation that integrated Buddhism and Shinto.

ANSWER: Japan; accept Nippon

7) In the "National Schism", Prime Minister Venizelos helped govern this island. The 1913 Treaty of Bucharest gave this island to its current owner. The Venetians, who inspired this island's romance *Erotokritos*, called it Candia. In 1941, Nazi paratroopers took this island, but not George II, after battles at Chania. (\*) Thucydides called this Greek island a thalassocracy. This island's capital of Heraklion was captured after some Maltese pirates raided the Ottomans, who earlier took Cyprus east of it. Linear A was used by its Minoans at Knossos. For 10 points, name this Mediterranean island which El Greco fled.

ANSWER: Crete or Kriti

8) The ionic types of these substances have one organic component and poorly coordinated ions below 100 °C. The Young-Laplace equation describes their interfaces, and the sol-gel process makes solids from two-phase systems made mostly of them. Micro-syringes and separatory (\*) funnels are commonly used to extract these substances. They have short-range order and equal potential and kinetic energy levels. These substances can be removed with muffle furnaces and desiccants, and have menisci. Distillations separate these substances. For 10 points, name this phase of matter formed by fusion, or melting.

ANSWER: liquid; prompt on "fluids"

9) One group of artists from this country made works such as *What is Truth?* and *Sadko in the Underwater Kingdom*, and was called The Wanderers. Works like *Black Square* and *White on White* were by an artist from this country who founded the Suprematist movement. Another artist from this country created works he called "compositions", and his painting (\*) *The Blue Rider* names a group of German Expressionists. The life of an icon painter from this country was the subject of a film by Andrei Tarkovsky. For 10 points, name this home country of the artists Andrei Rublev, Kazimir Malevich and Wassily Kandinsky.

ANSWER: Russia; prompt on answers relating to the "Soviet Union" or "USSR" since only Tarkovsky was born in that particular polity <JG>

10) The "oxygen sag curve" describes pollutant effects on these bodies of water. These water bodies interact with aquifers in hyporheic zones and can have clean and septic zones. Their re-aeration coefficients determine whether these bodies of water are "sluggish" or "rapid". They can form natural levees by deposition. Prior appropriation and the (\*) riparian doctrine are ways of distributing land along these water bodies. These water bodies have oxbows, bends, and meanders along them. These bodies of water can be tidal if they have estuaries. For 10 points, name these freshwater bodies that have tributaries, mouths, and deltas.

ANSWER: rivers or streams

11) John Coltrane's original recording of *Giant Steps* features solos from the tenor saxophone and this instrument, played by Tommy Flanagan. One song composed by a player of this instrument claims that "it makes no difference if it's sweet or hot" and includes many "doo-wahs" in the lyrics. *Waltz for Debby* was written by a man who played this instrument, (\*) Bill Evans. A band led by one man who played this instrument played standards like one that urged the listener to "go to Sugar Hill way up in Harlem." For 10 points, name this instrument played by the composer of "It Don't Mean a Thing" and "Take the A Train," Duke Ellington.

ANSWER: piano or pianoforte <DS>

12) When this quantity increases, the rotational relaxation time decreases. The process of scanning in calorimetry monitors changes in this quantity. Interstitial diffusion is dependent on this quantity, which is multiplied by the ideal gas constant in the Arrhenius equation. Alpha and gamma are length and volume (\*) expansion coefficients for changes in this quantity. This macroscopic variable is not pressure or volume, and it is in the denominator of the Clausius inequality for entropy. Isothermal processes hold it constant, and evaporative cooling decreases it. For 10 points, name this quantity measured in degrees Celsius or Kelvin.

ANSWER: temperature

13) Charles of Anjou named himself the king of this modern-day country after he was expelled from Sicily in the Sicilian Vespers. Aubrey Herbert was later offered its throne, but refused in favor of Prince William of Wied. Its national hero formed the League of Lezhë [leh-JUH] and led three defenses of Krujë. That hero, Skanderbeg, was eventually unable to stop the (\*) Ottoman rule of this nation. One leader of this nation defeated Prime Minister Fan Noli and was named King Zog, and a dictator of this nation had a secret police called the Sigurimi. For 10 points, name this country once ruled by Enver Hoxha [ho-SHA] from Tirana.

ANSWER: Republic of Albania or Shqiperia or Republika e Shqiperise <CC>

14) This musician recorded a duet with Phoebe Snow on his hit “Gone at Last”, and he collaborated with Derek Walcott on the lyrics for his album *Songs from the Capeman*. This singer of “Kodachrome” recorded “The Boy in the Bubble” and (\*) “You Can Call Me Al” for another album. That album by this man was inspired by a trip to South Africa and was named after Elvis Presley’s estate. In 1963, this man formed a duo with Art Garfunkel. For 10 points, name this American folk-rock singer of “50 Ways to Leave Your Lover” that released the album *Graceland* in 1986.

ANSWER: Paul Simon; both parts required <VP>

15) This author wrote a novel whose title character is a vagrant that sucks on pebbles and is pursued by the detective Moran. A man, his wife, and his mistress sit in giant urns and speak in this man’s drama called *Play*. That resembles another work by this man in which Nell and (\*) Nagg live in dustbins. This author of *Molloy* and *Endgame* wrote a play in which the title character listens to recordings of himself made 30 years ago. He wrote a play opening with a man pulling off his boots that had a bare tree where Vladimir and Estragon were told to meet the title figure. For 10 points, name this Irish author of *Krapp’s Last Tape* and *Waiting for Godot*.

ANSWER: Samuel (Barclay) Beckett <JG>

16) One god of this animal blew on the sun and moon to set them in motion, and his rule was ended when hurricanes destroyed the sun, and humans became monkeys. One of these creatures was turned into a gray cat, which is why Thor had trouble lifting that cat when challenged. In Australian mythology, this creature creates (\*) laws during dreamtime, and inhabits waterholes. One was sent by Hera to prevent Leto from giving birth where the sun shined, and was later killed by Apollo. For 10 points, name these creatures, including the “Rainbow” and “Midgard” types.

ANSWER: snakes; accept serpents; do not accept or prompt on **dragon** <KD>

17) Termination of this process requires the presence of RF-1 or RF-2, which prevents the formation of a bond between a carboxyl group and a certain molecule. The presence of N-formylmethionine initiates this process in prokaryotes, where this process’ start signal is preceded by the Shine-Dalgarno sequence. In the translocation step of this process (\*), molecules move from the A-site to the P-site. In one step of this process, amino acids are activated by covalently bonding to transfer RNAs. For 10 points, name this process in which ribosomes produce polypeptides using information provided by mRNA.

ANSWER: translation <DS>

18) **The second movement of a work of this type has five variations on a theme taken from a setting of a poem by Matthias Claudius. Mozart included a very dissonant opening with one work of this type, leading to its nickname of “Dissonance.” Like symphonies, they usually contain (\*) four movements.** The melody of the second movement of one of these works later served as the basis of the German national anthem. That piece was composed by Joseph Haydn, who is called the father of both symphonies and this type of composition. For 10 points, name these pieces composed for an ensemble that contains two violins, one viola, and one cello.

ANSWER: string quartet <SC>

19) **In one book, members of this occupation escape the United States via the “Underground Frailroad.” These people wear red dresses with white wings on their heads to restrict their vision and are taught to be submissive and obedient by the Aunts. One character with this job, (\*) Moira, escapes the Red Center, but she is captured and becomes a prostitute at Jezebel’s. Women with this occupation must have sex with their Commanders during the Ceremony in order to repopulated Gilead.** For 10 points, name this job held by many people in a namesake Margaret Atwood novel, including Offred.

ANSWER: handmaids (From the Handmaid’s Tale) <DM>

20) **Corruption in this industry was revealed in the “Mulligan letters”. Building one of these was called the “work of giants” by General Sherman. George Westinghouse invented the air brake for this industry. A Great Strike of this industry occurred in 1877, and it basically created lobbying. In 1877, 8 cases, including (\*) *Munn v. Illinois*, were heard about this industry. “Robber barons” like Cornelius Vanderbilt invested in this industry, and the Crédit Mobilier scandal damaged a Pacific one in 1873. They included one built over the National Road, called the Baltimore & Ohio, and a Transcontinental one.** For 10 points, name this industry of trains on rails.

ANSWER: railroads

### Bonuses

1) For 10 points each, answer some tricky questions about these mythological tricksters.

[10] This Native American trickster god created humanity by kicking a ball of dirt. He also stole fire from the gods, and escaped before the other gods stopped laughing.

ANSWER: Coyote

[10] This woman was coveted by both Gunnar and Sigurd, but only Sigurd passed through the fire around her castle. She then ordered Sigurd murdered, which she later committed suicide for out of regret.

ANSWER: Brunhilde

[10] This African trickster spider is the spirit of all knowledge of stories. At one point, he put all the world's knowledge in a pot, but it broke while he attempted to climb a tree, and knowledge was spread to all people.

ANSWER: Anansi <KD>

2) Monocytes differentiating into foam cells on blood vessel walls can cause this condition. For 10 points each:

[10] Name this process, externally characterized by pain, redness, swelling, and possibly heat. It is a primary immune response to injury and some diseases.

ANSWER: inflammation; accept word forms like inflammatory response

[10] These saturated or unsaturated acids, like arachidonate, are oxidized to form inflammatory prostaglandins. They can be omega-3, -6, or -9, and three of them make up triglycerides.

ANSWER: fatty acids; accept fatty acids

[10] This amine's H1 and H2 receptors are targeted by anti-allergenic drugs like Claritin and Allegra. This molecule is a de-carboxylated histidine with an imidazole ring side chain.

ANSWER: histamine

3) Name some cities with notable opera houses, for 10 points each:

[10] Marc Chagall painted the ceiling of this city's Palais Garnier [gahn-YAY], named for its architect.

ANSWER: Paris

[10] This Australian city's Jørn Utzon-designed opera house features several large concrete sail-shaped shells on its roof.

ANSWER: Sydney

[10] This German city's Festspielhaus [FEST-shpeel-house] is dedicated to the production of operas by Richard Wagner [RIK-ard VOG-nur]. Wagner's *Ring Cycle* is performed in its entirety at this city's namesake festival.

ANSWER: Bayreuth <CC>

4) This team defeated Kentucky 104-103 in the 1992 NCAA tournament on a buzzer-beater by Christian Laettner. For 10 points each:

[10] Name this college basketball team coached by Mike Krzyzewski [kri-SHEV-skee] that beat Wisconsin to win the 2015 NCAA tournament.

ANSWER: Duke Blue Devils; accept either or both

[10] This Duke freshman center and ACC player of the year was chosen 3rd overall by the 76ers in the 2015 NBA Draft.

ANSWER: Jahlil Okafor

[10] This former Syracuse point guard was the 2014 NBA Rookie of the Year while playing for the 76ers, but was then traded to the Milwaukee Bucks.

ANSWER: Michael Carter-Williams

5) They were also called “dragon bones” and often designated bamboo slips. For 10 points each:

[10] Name these bone fragments ground into medicinal powders by Chinese farmers in the 1900s, which actually documented ancestor worship in the Shang dynasty. Anyang was a major hub of trading these bones.

ANSWER: oracle bones

[10] The Shang dynasty arose along this colorful river, which transports loess, or silty soil, and floods a lot. It’s not the Yangtze River.

ANSWER: Yellow River or the Huang He

[10] The Shang-di was a god, which was created before this concept, called *tian*, existed. The “Mandate of” this place was passed from the gods to good emperors through a metal ring called the *bi*.

ANSWER: Heaven

6) This author wrote “The classics can console. But not enough.” at the end of his poem “Sea Grapes.” For 10 points each:

[10] Name this writer from St. Lucia who wondered “How can I face such slaughter and be cool? How can I turn from Africa and live?” in the poem “A Far Cry From Africa.”

ANSWER: Derek Walcott

[10] In his epic poem *Omeros*, Walcott used the fisherman Achilles and Hector to mimic the structure of this epic by Homer, which details the course of the Trojan War.

ANSWER: *The* Iliad

[10] Walcott studied at the University of the West Indies in this country, which produced Claude McKay and the author of the 2015 Booker Prize-winning novel *A Brief History of Seven Killings*, Marlon James.

ANSWER: Jamaica <JG>

7) One of these structures has sines and cosines as its entries and is used to rotate a point about the origin. For 10 points each:

[10] Name these non-tensor structures that come in the aforementioned “rotation” type. They may be used in other transformations as well, such as in shearing.

ANSWER: matrix or matrices

[10] Generally, transformation matrices are of this shape. Identity matrices also have this shape because they have equal numbers of rows and columns.

ANSWER: squares

[10] A two-by-two matrix has entries a, b, c, and d. If you want to reflect a point over the line *y equals x* using that matrix, what are the values of a, b, c and d?

ANSWER: a = 0, b = 1, c = 1, d = 0; **do not accept answers out of order**, unless the letters correspond <HW>

8) These events followed the abandonment of a “prestige objective” by Eisenhower, which was the capture of Berlin. For 10 points each:

[10] The “Big Three” met at one of these at Yalta where “Stalin held all the cards”. Name these events that occurred at Bretton Woods and Potsdam.

ANSWER: conferences after WWII or postwar conferences

[10] A 1947-made body and an 11-member United Nations body share this name, and were created in the Cold War after Yalta and Potsdam. The US one wrote a 1968 document to the President about non-nuclear warfare options.

ANSWER: National Security Council or UN SC

[10] This “Mr. Prima Donna” was authorized to conquer Korea by NSC-81/1, but was later replaced by Matthew Ridgway after he insisted on following NSC-81/1 in 1951.

ANSWER: Douglas MacArthur

9) This man, though not from New York, broke out from a high security prison and then lobbed some fiery tweets at a Republican candidate. For 10 points each:

[10] Name this wanted Mexican drug-lord who broke out of prison for the second time in July. This man heads the Sinaloa cartel.

ANSWER: Joaquin “**El Chapo**” Guzman

[10] Chapo Guzman was responsible for smuggling cocaine from this country, where a June unilateral truce between rebels and the government could stop that flow of drugs for one month.

ANSWER: Republic of **Colombia**

[10] El Chapo Guzman was marked as “Public Enemy #1” by this city for his influence in its criminal network, even though there is no evidence that he ever visited this city.

ANSWER: **Chicago** <AS>

10) This piece of music was originally envisioned as a ballet commissioned by Ida Rubenstein. For 10 points each:

[10] Name this one-movement piece that opens with an ostinato rhythm played by snare drums. It is based on a namesake Spanish dance.

ANSWER: **Boléro**

[10] *Boléro* is perhaps the most famous work by this French composer whose other works include *Pavane for a Dead Princess* and the one-act ballet *Daphnis et Chloé*.

ANSWER: (Joseph) Maurice **Ravel**

[10] This collection of pieces for solo piano by Ravel is notoriously difficult. It includes the *Scarbo* movement that depicts the mischief of a Goblin.

ANSWER: **Gaspard de la nuit**: *Trois poèmes pour piano d'après Aloysius Bertrand* or **Gaspard de la nuit**: *Three poems for piano by Aloysius Bertrand* <JG>

11) The recent works of Jean-Luc Godard have been defined as the “film” type of this form of writing. For 10 points each:

[10] Name these types of compositions that are often personal narratives regarding a subject. Collections of these kinds of compositions include Joan Didion’s *The White Album* and David Foster Wallace’s *A Supposedly Fun Thing I’ll Never Do Again*.

ANSWER: **essays**

[10] The popularization of the essay is usually credited to this French nobleman whose *Essais* include “Of Cannibals” and “Apology for Raymond Sebond.”

ANSWER: Michel de **Montaigne**

[10] Lectures by this Italian author were collected in essay collections such as *Six Memoirs for the Next Millennium* and *The Uses of Literature*. Novels by this man include *If on a winter’s night a traveler* and *Invisible Cities*.

ANSWER: Italo **Calvino** <JG>

12) This author described fighting between two clans in his poem *The Lay of the Last Minstrel*. For 10 points each:

[10] Name this Scottish author who ended his novel *Ivanhoe* with the title character’s marriage to Lady Rowena.

ANSWER: Walter **Scott**

[10] Diana Vernon and Frank Osbaldistone fall in love during the Jacobite Rising of 1715 in this Scott novel named after a Scottish outlaw.

ANSWER: **Rob Roy**

[10] Much of Scott’s output can be classified as this genre of fiction, in which the plot is set sometime in the past. Much of the work of E.L. Doctorow is considered part of this genre.

ANSWER: **historical** fiction; accept reasonable equivalents <CC/JG>

13) This quantity equals the velocity ratio and is greater than one for cam mechanisms. For 10 points each:

[10] Name this constant, the ratio of an input force to an output force that is greater than one for class 2 levers like wheelbarrows.

ANSWER: **mechanical advantage**; prompt on “MA”

[10] The kinetic form of this force can reduce mechanical advantage and can be measured with a ramp test. It opposes the direction of motion.

ANSWER: **friction**

[10] Friction is one of these types of forces, which contrast with “field forces” derived from electromagnetic and gravitational fields that cause action-at-a-distance.

ANSWER: **contact** forces

14) This poem begins with the invitation “Let us go then, you and I / When the evening is spread out against the sky”. For 10 points each:

[10] Name this poem in which the speaker asks “Do I dare to eat a peach?” while in a room where “the women come and go / Talking of Michelangelo.”

ANSWER: “**The Love Song of J. Alfred Prufrock**”

[10] This author of “The Love Song of J Alfred Prufrock” began his long poem “The Waste Land” with the line “April is the cruellest month.”

ANSWER: (Thomas Stearns) T.S. **Eliot**

[10] One figure in Eliot’s The “Waste Land” is this man with “wrinkled dugs” who can see “the evening hour that strives homeward.” An early Surrealist drama by Guillaume Apollinaire was titled for the “breasts of” this figure.

ANSWER: **Tiresias** <RL/JG>

15) Dharavi is the largest one of these places in Asia, and ones around Lima are called *pueblos jóvenes*. For 10 points each:

[10] Name these neighborhoods, which favelas, townships, and are examples of. These usually urban areas are often unfit for human habitation, and their inhabitants are usually poor.

ANSWER: **slums** or **squatter** settlements or **shantytowns** or **hovels** or similar answers; be lenient

[10] Slum upgrading is near the opposite of this process, which is done by the middle or upper class people who move into worse-off areas and often cause the dislocation of their residents.

ANSWER: **gentrification**

[10] Downtown areas, where many slums are located, usually contain these accessible economic areas. They are usually transportation, office, and commercial hubs with high building densities.

ANSWER: **CBDs** or **central business districts**

16) During one revolution by these people, a king refused to pick up a “crown from the gutter” during the “Hungry Forties”. For 10 points each:

[10] Name these people who forced the calling of the Frankfurt Assembly and much later revolted at Sorbonne University in 1968. Tiananmen Square and Tlatelolco were other sites of their uprisings.

ANSWER: **students**

[10] “Great Germans” and “Small Germany” advocates debated during the Frankfurt Assembly about uniting Germany with Austria. That happened in this 1938 Hitler-sponsored event after the Sudetenland annexation.

ANSWER: **Anschluss**

[10] Students in the Civic Forum, led by Vaclav Havel, drafted this pro-civil and pro-human rights document in 1968 in Communist Czechoslovakia.

ANSWER: **Charter 77**



17) A scared-looking young man in a stovepipe hat holds a gun and stands to the left of the title figure of this painting, which depicts the July Revolution of 1830. For 10 points each:

[10] Name this allegorical painting in which the central figure stands bare-chested holding a musket with her left hand and a tri-color flag aloft in her right.

ANSWER: Liberty Leading the People

[10] *Liberty Leading the People* is a painting by this French Romantic painter who also painted works such as *The Women of Algiers* and the *Death of Sardanapalus*.

ANSWER: (Ferdinand Victor) Eugene Delacroix

[10] In this other Delacroix painting, a man gnaws at the front of the title conveyance, in which a man with a red cap and scarf is held by another with a brown cloak and a wreath on his head while the City of the Dead burns.

ANSWER: *The Barque of Dante* or *Dante and Virgil in Hell* <JG>

18) A political cartoon depicting this period shows Emir Sher Ali asking the reader to “save him from [his] friends”. For 10 points each:

[10] Name this Anglo-Russian conflict in the mid-1800s over Central Asia, which included the partitioning of Persia into spheres of influence, the Eastern Question, and the Anglo-Afghan wars.

ANSWER: the Great Game

[10] They’re not colonies, but Afghanistan and Persia during the Great Game were these states that rely on larger powers for diplomatic and military support while having their own government, and Morocco was another one.

ANSWER: protectorates

[10] Protectorates were common on this continent, the subject of the Berlin Conference, which started its namesake Scramble. Cecil Rhodes’ proposed Cape-to-Cairo railroad would have connected ends of this continent.

ANSWER: Africa <AS>

19) Ball-and-stick models of molecules do not show this quantity accurately, whereas space-filling models do. For 10 points each:

[10] Name this quantity, the derivative of volume and the outer space of a molecule, represented by the 3D edges of its electron clouds.

ANSWER: surface area; prompt on “area”

[10] It’s not an activated complex, but, during a reaction, reactants with accessible surface areas will eventually become this single state with the highest potential energy, at which point the reactants will have to form products.

ANSWER: transition state

[10] In molecular models, this quantity is the simplified distance from a nucleus that a molecule’s electron clouds extend. A hard sphere around an atom is based on this Dutch-named value.

ANSWER: van der Waals radius or van der Waals contact distance; prompt on any incomplete answer

20) Away in a manger, no crib for his bed, the little Lord Jesus laid down his sweet head. For 10 points each:

[10] This mother of Jesus wrapped him in swaddling clothes and laid him in the manger. The angel Gabriel had earlier announced to her that she would bear the son of God.

ANSWER: the Virgin Mary or Saint Mary

[10] Jesus was born in this town, to which his parents Mary and Joseph traveled from their hometown of Nazareth in the Gospel of Luke. The book of Micah states that the Messiah would be born in this town.

ANSWER: Bethlehem

[10] This king sent the wise men to visit Jesus, since he was worried that this “King of the Jews” might usurp his power. He then ordered the Massacre of the Innocents to kill all boys under two in the area of Bethlehem.

ANSWER: King Herod the Great <CC>