

Collective Early Release Entry-level Set (CERES)

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Packet 5

Tossups:

1. **The gamma function generalizes this function to non-integer values. The formulas for permutations and combinations contain several instances of this operation, which also gives the number of ways to arrange some number of distinguishable objects in (*) order.** For 10 points, what rapidly-growing function denoted by an exclamation point gives the product of all positive integers up to the input?

ANSWER: **factorial** [prompt on exclamation point] <Jogadhenu, Math>

2. **This leader's expedition in Egypt included the Battle of the Nile and led to the discovery of the Rosetta Stone. This leader implemented the Continental System after winning the Battle of Austerlitz. This leader failed to invade (*) Russia in the winter of 1812 and was exiled to St. Helena after his defeat at the Battle of Waterloo.** For 10 points, what legendarily short French emperor took power after the French Revolution?

ANSWER: **Napoleon** Bonaparte [or **Napoleon I**; do NOT accept or prompt on "Napoleon III"] <Koutsoukos, History>

3. **These structures have A, P, and E sites whose parts are measured in Svedberg units. The nucleolus creates these organelles, which are made up of a namesake type of RNA. These organelles decipher mRNA to produce a chain of amino acids from each codon in a process called (*) translation.** The binding of these organelles to the ER makes it "rough". For ten points, what organelles synthesize proteins?

ANSWER: **ribosome** <Bhattacharyya, Science>

4. **This artist included *Suicide (Fallen Body)* in his *Death and Disaster Series*. A piece by this man included 50 copies of a still from the film *Niagara*. Radical feminist Valerie Solanas shot this man in his studio, the (*) Factory.** This man made a series of prints of actress Marilyn Monroe. "Tomato" and "Chicken Noodle" are silkscreen prints by, for 10 points, what American Pop artist who created numerous depictions of Campbell's soup cans?

ANSWER: Andy **Warhol** [or Andrew **Warhola**] <Young, Fine Arts>

5. **A citywide boycott in Liverpool of the newspaper *The Sun* was prompted by its coverage of a disaster in one of these places which killed 96 people. Ai (eye) Weiwei designed one of these structures in Beijing called the "Bird's Nest" for the 2008 (*) Olympics.** The ancient Panathinaikos, one of these structures in Athens, hosted many events during the first Olympic Games. For 10 points, what structures are used to host football games?

ANSWER: **stadiums** [or **stadia**; accept specific answers like **Olympic stadia** or **soccer stadia** or **football stadia** or **football grounds**] <Kher, General Knowledge>

6. A poem written during this war calls a leader in it "His Excellency" and was penned by Phyllis Wheatley. A poem set during this war describes lighting lanterns "one if by land / and two if by sea" and begins "Listen my children and you shall hear" of the title man's (*) midnight ride warning of the redcoats. For 10 points, a Longfellow poem describes Paul Revere warning colonists of the British attacking during what war?

ANSWER: American Revolutionary War [or the American Revolution] <Kher, Literature>

7. A group supporting this cause that held signs demeaning "Kaiser Wilson" outside the White House were the "Silent Sentinels" led by Alice Paul. The "Declaration of Sentiments" was written to support this cause at the 1848 Seneca Falls Convention. The (*) 19th Amendment granted and Elizabeth Cady Stanton and Susan B. Anthony supported, for 10 points, what right of a certain group to participate in elections?

ANSWER: women's suffrage [accept descriptive answers mentioning women's right to vote; prompt on partial answer] <Kher, History>

8. This event followed one woman's visit to her cousin Elizabeth; that woman had earlier been visited by the angel Gabriel in the Annunciation. This event took place in a barn because its central couple was traveling to register for the census of King (*) Herod. This event was attended by the Three Magi, who saw a star in Bethlehem. For 10 points, name this event in which a Christian religious figure was born.

ANSWER: the birth of Jesus [accept any obvious equivalents indicating Jesus or Christ being born, accept the First Christmas; prompt on just Christmas by asking "what event does that holiday celebrate?"] <Gjesfjeld, Religion>

9. Both the Kaibab Plateau and the Havasupai Indian Reservation are located in and around this geographic feature. Visitors can walk on a glass sky bridge built over this feature, which is around (*) 6,000 feet deep and was formed by millions of years of erosion caused by the flow of the Colorado River. For 10 points, name this geographic feature in northwest Arizona, the longest canyon in the United States.

ANSWER: Grand Canyon [accept Grand Canyon National Park] <Kher, Geography>

10. This ruler brought back his country's traditional religion after it was changed to a monotheistic one-deity religion by his father Akhenaten. Studies of this ruler's injuries have led to theories that he died in a chariot accident. This ruler's tomb in the Valley of the Kings supposedly (*) cursed Lord Carnarvon and was found by archaeologist Howard Carter. For 10 points, name this "Boy Pharaoh" of Egypt who died at age 19.

ANSWER: King Tut [or Tutankhamun, or Tawat Sankhu ?aman] <Emmanuel, History>

11. A book about the "Life and Death of" American instances of these places opposed their "renewal", which often displaced Black residents of them. Parts of these places were "redlined" to deny access to housing assistance for minorities. A phenomenon called "white flight" saw white people move out of these places into (*) suburbs. Poverty is often associated with the "inner" parts of, for 10 points, what large urban areas?

ANSWER: cities <Kher, Social Science>

12. "Oil of vitriol" and "aqua regia" are archaic names for some of these substances, which are defined as proton donors in the Bronsted-Lowry definition. Vinegar is a solution of water and the acetic one of these kinds of substances, and other examples of these substances include the (*) sulfuric and hydrochloric types. For 10 points, what substances have a pH lower than 7 and are contrasted with bases?

ANSWER: acids <Bodducherla, Science>

13. **This country's police fired on a crowd protesting "pass-book laws" in the Sharpeville massacre. This country's Rivonia trial accused a man who later won a Nobel Prize with F.W. De Klerk; that leader wrote the book *Long Walk to Freedom* and was imprisoned on Robben Island. An (*) Afrikaans-speaking white minority created the policy of apartheid that Nelson Mandela opposed in, for 10 points, what country on the tip of Africa?**

ANSWER: Republic of **South Africa** [or **RSA**] <Emmanuel, History>

14. **Gustav Mahler's first symphony is titled for this word. Methane lakes are found on a moon with this name which contains the densest atmosphere of all solar system satellites. One member of a group of beings with this name was forced to hold up the heavens on his shoulders, and was among many parented by Rhea and (*) Cronos. For 10 points, name this word shared by Saturn's largest moon and Greek gods preceding the Olympians.**

ANSWER: **Titans** [accept **Titan** Symphony] <R. Ganeshan, General Knowledge>

15. **This team lost 4 straight Super Bowls in the 1990s, including one after Scott Norwood missed a game-winning field goal. Folding tables are jumped into by this team's "Mafia" fanbase. In 2020, this team became the first non-Patriots (*) AFC East winner in a decade. Sean McDermott coaches this team, which traded for wide receiver Stefon Diggs in 2020. Josh Allen plays for, for 10 points, what NFL team from western New York?**

ANSWER: **Buffalo Bills** [accept either underlined portion] <Kher, Popular Culture>

16. **He's not Apollo, but this god sent a monster to ravage the land when King Laomedon (LAY-oh-me-don) didn't reward him for building the walls of Troy like promised. After being taunted by the hero Odysseus, Polyphemus prayed to this god, his father. This god lost a contest in which he created the first horse to (*) Athena to become the patron god of Athens. For 10 points, name this brother of Zeus and Hades, and god of the sea.**

ANSWER: **Poseidon** <Jogadhenu, Mythology>

17. **In the first sentence of this novel, a girl asks "where's Papa going with that axe?". After the protagonist of this novel is sold to Homer Zuckerman, the rat Templeton helps him. A character in this novel (*) spawns 514 children and writes messages like "SOME PIG" before dying at the county fair. For ten points, name this novel by E.B. White about the pig Wilbur and the title spider.**

ANSWER: **Charlotte's Web** <Gjesfjeld, Literature>

18. *Description acceptable.* **One of these things found in the East African Rift Valley's Hadar site is named for a Beatles song, and another of these things, Ötzi, was called "the Iceman" after being found frozen. AL 288-1, known as Lucy, is one of these things, which may be remnants of the *Australopithecus* or (*) Neanderthal species, according to hominid-studying paleontologists. For 10 points, what things are frequently found in graves?**

ANSWER: **human remains** [accept anything indicating **dead people** or **skeletons** or **mummies**; prompt on **fossils** by asking "of what sort of creature?"] <Kher, Science>

19. **An image released in 2019 depicting one of these objects was taken in the M87 galaxy. These objects, which cause spaghettification, emit Hawking radiation due to effects of their event horizons. These objects can be found at the (*) centers of most galaxies. The death of a sufficiently massive star can form, for 10 points, what regions in space where gravity absorbs everything around it, including light?**

ANSWER: **black holes** <Kohn, Science>

20. **In one part of this play, a character calls one of his enemies "the prince of cats" during a duel. One of the protagonists of this play goes to Friar Lawrence for advice. In this play, Benvolio fights with Tybalt, who had earlier killed the eccentric Mercutio. The houses of (*) Montague and Capulet feud in this play's setting of Verona. For 10 points, name this Shakespeare tragedy about two "star-crossed lovers".**

ANSWER: **Romeo and Juliet** <Jogadhenu, Literature>

Bonuses:

1. This interstate highway wasn't fully continuous until a junction in Pennsylvania was completed in 2018. For 10 points each:

[10] Name this interstate highway which runs down the Eastern Seaboard, connecting cities like New York City and Washington, DC. It is the nation's busiest interstate and runs through 15 states, more than any other.

ANSWER: Interstate **95**

[10] The northern terminus of Interstate 95 is in this state's town of Houlton, on the border with Canada. The highway also passes through this state's cities of Portland and Augusta, the state capital.

ANSWER: **Maine**

[10] Interstate 95 follows the conventional numbering system for interstate highways, in which numbers with this quality are assigned to north-south highways. The most important north-south highways are given numbers ending in 5 as part of that system.

ANSWER: **odd** numbers <Thompson, Geography>

2. Answer the following about weird Chinese emperors. For 10 points each:

[10] Emperor Zhou of Shang constructed an Alcohol Pool and a forest consisting of this general type of food, examples of which are pork, ham, and chicken.

ANSWER: **meat**

[10] This dynasty's emperor Toghon Temür once considered the idea of killing everyone with the surnames Zhang, Wang, Liu, Li, and Zhao, which would've killed more than 90% of China's population. This dynasty was established in China by Kublai Khan.

ANSWER: **Yuan** dynasty

[10] This dynasty's Emperor Gaozu would occasionally rip off the hats of scholars and pee in them. This dynasty gives its name to the majority ethnic group of China.

ANSWER: **Han** dynasty <Young, History>

3. This team beat Ohio State to win the 2020 college football national championship. For 10 points each:

[10] Identify this SEC university, nicknamed the Crimson Tide, who has won three of the last six national championships. It is located in Tuscaloosa and contests the Iron Bowl with in-state rivals Auburn.

ANSWER: University of **Alabama**

[10] Alabama is led by this legendary coach, often considered one of the greatest college coaches of all time. In the 2017 special election for Senate in Alabama, this man received thousands of write-in votes, which may have helped swing the election for Doug Jones.

ANSWER: Nick **Saban**

[10] In 2013, Alabama lost the Iron Bowl on the last play of the game after Chris Davis scored a 109-yard touchdown in this manner to win the game for Auburn. A description is acceptable.

ANSWER: **returning** a missed **field goal** [accept anything about a **field goal** return; accept the **Kick Six**] <Tagtmeier, Popular Culture>

4. Answer the following about public transit in the former Soviet Union, for 10 points each:

[10] Like many other Soviet cities, this city's subway stations were given ornate designs. Tourists in this city can take the subway to places like the Bolshoi Theatre, Red Square, and the Kremlin.

ANSWER: **Moscow** [or **Moskva**]

[10] Large vans called *marshrutki* are used in many Soviet cities instead of this form of public transit. In the US, intercity service in this form of transit is provided by companies like Peter Pan and Greyhound.

ANSWER: **buses**

[10] Soviet rail infrastructure paved the way for this country's Afrosiyob high-speed rail line, which runs every day between this country's cities of Samarkand and Tashkent.

ANSWER: Republic of **Uzbekistan** [or **O'zbekiston** Respublikasi] <A. Gao, Geography>

5. Answer these questions about ways politicians have left office sooner than expected, for 10 points each:

[10] Gray Davis, the governor of California, was removed from office in a recall election in 2003 and replaced by this Austrian-born actor best known for playing the Terminator.

ANSWER: Arnold **Schwarzenegger**

[10] Richard Nixon resigned the presidency rather than be removed from office through this method. Donald Trump was subjected to this action twice in the House, but in neither case did the Senate vote to remove him from office.

ANSWER: **impeachment**

[10] This man left the presidency, as well as this mortal coil, after being assassinated by Charles Guiteau, who was angry over this man's attempted civil service reforms. He is the only sitting member of the House to be elected president.

ANSWER: James **Garfield** <A. Gao, History>

6. Answer these questions about attempts to attack hurricanes, for 10 points each:

[10] Weather control made headlines in 2019 when it was revealed that Donald Trump had inquired about the feasibility of preventing hurricanes by doing this action to them. While doing this action to a hurricane wouldn't prevent it, it would make the storm vastly more dangerous by making its rain radioactive.

ANSWER: **nuking** it [accept anything indicating using **nuclear weapons** or **nuclear bombs** or other obvious equivalents against the hurricane; prompt on **bombing**]

[10] When Hurricane Irma hit this US state in 2017, a local sheriff's office had to issue a statement telling residents not to shoot guns at the hurricane. This state's cities of Palm Beach and Fort Lauderdale were heavily flooded by Irma.

ANSWER: **Florida**

[10] The US Navy experimented with a method of weakening hurricanes using cloud seeding, a real scientifically-proven method of inducing additional precipitation, most frequently using a compound of silver and this halogen. This element generally appears purple in pure form.

ANSWER: **iodine** [accept **iodide**] <Thompson, Science>

7. Squidward is known for his lack of skill at playing this instrument. For 10 points each:

[10] Name this single-reed woodwind instrument which was primarily played by Benny Goodman. This instrument plays the opening glissando to open *Rhapsody in Blue*.

ANSWER: **clarinets**

[10] *Rhapsody in Blue* was composed by this American composer who also used taxi horns in his *American in Paris*. *Porgy and Bess* is an opera written by this composer.

ANSWER: George **Gershwin** [accept Jacob Bruskin **Gershowitz**]

[10] George Gershwin composed an overture named after this country, which served as the origin for the "Rumba" style of music and dance. *Guantanamera* is an often performed patriotic song from this country with lyrics written by José Martí.

ANSWER: Republic of **Cuba** <Bhattacharyya, Fine Arts>

8. Answer the following about America's favorite memelord, Bernie Sanders. For 10 points each:

[10] Sanders was shown donning a pair of warm-looking mittens at this 2021 event. This event was held exactly two weeks after the January 6th attacks.

ANSWER: the presidential **inauguration** of Joseph Robinette **Biden** Jr. [accept obvious equivalents; prompt on **inauguration** alone]

[10] Sanders is from this state, where after Biden's inauguration he joked that this state "make[s] good mittens" and "good coats." Sanders' mittens were made by a teacher from this state who lives near its city of Burlington.

ANSWER: **Vermont**

[10] In a 2019 ad, Sanders said he was "once again asking" for this general thing. ActBlue can be used to collect this thing by Democratic politicians.

ANSWER: **money** [or **donations**; accept "I Am Once Again Asking for Your **Financial Support**"; accept campaign **funds**; accept **currency** or **USD**; prompt on **support** alone] <A. Gao, General Knowledge>

9. Answer the following about various harsh punishments from Greek mythology. For 10 points each:

[10] A hunter named Actaeon attempted to spy on this maiden goddess, and was subsequently turned into a stag and killed by his own dogs. She is also the sister of Apollo.

ANSWER: **Artemis**

[10] After being blinded by Hera for agreeing with Zeus, Tiresias gained the ability to understand these animals. "Stymphalian" examples of these animals were chased away by Hercules from a swamp.

ANSWER: **birds**

[10] When Tantalus attempts to feed his son to the gods, only this deity eats the food, consuming Pelops's shoulder. This deity also enlists Hecate in a quest to find her daughter who was kidnapped by Hades.

ANSWER: **Demeter** [do not accept or prompt on "Ceres"] <Gollamudi, Mythology>

10. Some theories claim that this figure was Queen Victoria's grandson. For 10 points each:

[10] Name this unidentified serial killer. He likely killed between five and eleven women in the London district of Whitechapel in 1888.

ANSWER: **Jack the Ripper** [or **Leather Apron**]

[10] Jack the Ripper may have sent George Lusk, a neighborhood watch leader, the "From Hell" letter along with half of one of these organs purportedly taken from one of his victims.

ANSWER: a **kidney**

[10] A 2006 poll conducted by this company voted Jack the Ripper the worst Briton in history. This company, known by a three-letter abbreviation, is the national radio and TV service of the UK.

ANSWER: the **BBC** [or the **British Broadcasting Corporation**] <Gjesfjeld, History>

11. For 10 points each, answer the following about the speed of sound:

[10] In these substances, the speed of sound is dependent only on the temperature and the composition of the type of this substance it is travelling through. Their namesake law states that $PV=nRT$.

ANSWER: **ideal gases** [prompt on **gases**]

[10] Objects moving at speeds greater than Mach [this number] are moving faster than the speed of sound.

ANSWER: **1** [or **one**]

[10] The speed of sound in a certain substance can be calculated as the square root of the bulk modulus over this other quantity. This quantity is equal to mass divided by volume.

ANSWER: **density** <Gollamudi, Science>

12. Hush! The trees are speaking about their personal problems. For 10 points each, answer the following about things they might complain about:

[10] The trees might complain about having this outer layer being broken by things like squirrels or birds hunting for things within them. When you touch a tree, you are typically touching this outer surface of the tree.

ANSWER: the **bark**

[10] The trees might also complain about not having enough water, which is usually transported through this type of vascular tissue. Wood is an example of this type of vascular tissue.

ANSWER: the **xylem**

[10] The trees are sad about being cut down because they have a role in removing a gas containing this element from the atmosphere. Nanotubes of this element are notable for their high strength, and buckyballs are formed from this element.

ANSWER: **carbon** <Gollamudi, Science>

13. The speaker of one Li Bai poem describes thinking of his hometown after looking at this object. For 10 points each:

[10] In that poem, the light from this object is compared to "frost on the ground". Another Li Bai poem describes "Drinking Alone by [this object's] light".

ANSWER: the **moon** [accept "Drinking Alone By **Moonlight**"]

[10] Li Bai supposedly drowned while drunkenly trying to embrace the moon's reflection on one of these bodies of water. He also wrote a poem titled for the wife of a merchant who works on one of these places.

ANSWER: a **river** [accept the Yangtze **River**, accept "The **River** Merchant's Wife"]

[10] Another Chinese poem by Du Fu describes the weeping of families as they watch carts on their way to one of these events. One of these events forms the central plot of *Romance of the Three Kingdoms*, in which Cao Cao (**TSAO TSAO**) confronts Liu Bei and Sun Quan (**SOON CHUAN**) at the Red Cliffs.

ANSWER: **war** [prompt on **battles** by asking what larger events they are a part of] <C. Gao, Literature>

14. For 10 points each, answer the following about things represented by the letter K in science:

[10] This 19th element of the periodic table is represented by the letter K. One might find relatively high quantities of this slightly radioactive element in bananas.

ANSWER: **potassium** [accept **kalium**]

[10] Dividing the concentration of the products by the concentration of the reactants can yield a constant with letter K named after this state where the forward and reverse rates of a reaction are equal.

ANSWER: **equilibrium** [accept **equilibrium constant**]

[10] Vitamin K is required for this process to occur in your body, which is inhibited by drugs such as warfarin. This process is enabled by platelets.

ANSWER: **coagulation** [accept **clotting** or **blood clotting**] <Gollamudi, Science>

15. In a Grace Lin novel, one of these mythical creatures was born from a painting when his eyes were dotted in and lacks the ability to fly because of a rock on his head. For 10 points each:

[10] Name these mythical creatures. In *The Hobbit*, one of these mythical creatures named Smaug sleeps under Lonely Mountain with his hoard of treasure.

ANSWER: **dragons**

[10] That Grace Lin novel is titled for one of these landforms that "Meets the Moon." In *Journey to the West*, the Monkey King goes behind a waterfall on one of these landforms named for flowers and fruit.

ANSWER: **mountains** [accept **Where the Mountain Meets the Moon**; accept **Fruit Flower Mountain**; accept **Mount Huaguo**]

[10] Grace Lin's novel *The Year of the Dog* is named after a sign in one of these systems originating in China and based on the lunar calendar. Signs in a western type of this system include Aries and Taurus.

ANSWER: a **zodiac** [accept **shengxiao**] <C. Gao, Literature>

16. This president famously proclaimed that "it takes more than that to kill a Bull Moose" when he was shot, after which he gave a full speech with a bullet lodged in his chest. For 10 points each:

[10] Name this 26th American president, who busted monopolies with his "Square Deal." After this president spared an animal while hunting, a popular stuffed toy was named for him.

ANSWER: **Theodore Roosevelt** [or **Teddy Roosevelt**; accept any answer that correctly disambiguates him from Franklin Delano Roosevelt; prompt on **Roosevelt**]

[10] Theodore Roosevelt is also known for negotiating the Treaty of Portsmouth, a peace which ended the 1904 to 1905 war between these two countries. Name both.

ANSWER: **Japan** [or Empire of **Japan** or **Nippon** or **Nihon**] AND **Russia** [or **Russian Empire**]

[10] Before becoming president, Theodore Roosevelt led the Rough Riders in America's war against this country in the 1890s. "Yellow journalists" urging war blamed the explosion of the USS *Maine* on this country.

ANSWER: Kingdom of **Spain** [or **España**] <Gollamudi, History>

17. Archbishop of Canterbury Thomas Becket was declared one of these kinds of people after he was executed by Henry II. For 10 points each,

[10] Name these types of people who are revered because they were killed for maintaining their religious beliefs. They are often, but not always, saints.

ANSWER: **martyrs**

[10] Saint Stephen, who is usually considered the first Christian martyr, was killed in this manner for opposing Jewish authorities.

ANSWER: **stoning** [or **lapidation**; accept anything indicating having **stones** or **rocks** thrown at them]

[10] This woman was considered a martyr and was declared a saint in 1920. This "Maid of Orleans" was burned at the stake by the British for heresy after maintaining that Saint Michael the Archangel appeared pleading for her to lead France to victory in the Hundred Years' War.

ANSWER: **Joan of Arc** [accept **Jeanne d'Arc**] <Emmanuel, Religion>

18. This poem talks about the title animal "burning bright/In the forests of the night;". For 10 points each:

[10] Name this poem whose narrator asks, "What immortal hand or eye/Could frame thy fearful symmetry?" while referencing the title predator.

ANSWER: The **Tyger**

[10] In another poem by that same author, the narrator, "wander thro' each charter'd street/Near where the charter'd Thames does flow." in this English city.

ANSWER: **London**

[10] This English author of *The Tyger* and *London* also included *The Chimney Sweeper* in his collection *Songs of Innocence and Experience*.

ANSWER: William **Blake** <A. Gao, Literature>

19. This group mocked the US, France, and UK forces during a mock funeral in Khost. For 10 points each:

[10] Name this group that took over a certain country after defeating a resistance movement in Panjshir Province. This group, which takes its name from the word "students," is largely led by Pashtun militants.

ANSWER: **Taliban** [or **Taleban**]

[10] The Taliban took over this country, the site of the US's longest war. The second-largest airlift took place during a withdrawal of this country's Hamid Karzai airport in its capital, Kabul.

ANSWER: **Afghanistan** [or Islamic Emirate of **Afghanistan** or Emārat-e Eslāmi-ye **Afghanistan** or Də **Afġānistān** Islāmī Imārat]

[10] Many Afghani refugees were flown to this country's Al Udeid Air Base, the largest in the Middle East. The first commercial flight since the Taliban takeover was by this country's national airline, which arrived in its capital of Doha.

ANSWER: **Qatar** [or State of **Qatar** or Dawlat **Qatar**] <A. Gao, Current Events>

20. Answer these questions about calculus, for 10 points each:

[10] Taking the derivative of a function is equivalent to calculating this property of a line tangent to the function's graph. This function can be calculated using the mnemonic "rise over run".

ANSWER: **slope**

[10] This calculus operation is the opposite of differentiation, and as such is sometimes called the antiderivative. It is usually denoted by a symbol resembling a vertically stretched S.

ANSWER: **integral** [or **integration**]

[10] As a general rule, functions can only have derivatives if they also have this property. Functions are often said to satisfy this property if their graph can be drawn without lifting your pencil.

ANSWER: **continuous** functions [or **continuity**] <R. Ganeshan, Math>