Section 1, Module 1: Reading And Writing

1) In the search for new impact craters on Mars, the roles of seismic monitoring and orbital imaging as data sources are: when vibrations detected with seismic monitoring indicate roughly where an impact has occurred, researchers can use orbital images of that relatively limited area of the rocky surface to precisely locate a new crater.

Which choice completes the text with the most logical and precise word or phrase?
A. interchangeable
B. exhaustive
C. redundant
D. complementary

---

2) The following text is adapted from Henry James's 1881 novel The Portrait of a Lady. Everything Osmond did was pose-pose so subtly considered that if one were not on the lookout one mistook it for impulse. Ralph had never met a man who lived so much in the land of consideration. His tastes, his studies, his accomplishments, his collections, were all for a purpose.

As used in the text, what does the word "consideration" most nearly mean?
A. Indecision
B. Calculation
C. Courtesy
D. Deference

---

3) Microplastics are a common pollutant in large masses of water like glaciers. High concentrations and _ among particles-variations in size, shape, and material-make it onerous to comprehensively classify the microplastics in a water sample, so Kutay Icoz et al. are exploring a device to help quickly and accurately identify certain characteristics.

Which choice completes the text with the most logical and precise word or phrase?
A. restraints
B. inconsistencies
C. incompatibilities
D. disruptions

---

4) The following text is adapted from the 1895 poem "Ojistoh" by Emily Pauline Johnson, a Kanienkahagen (Mohawk) writer also known as Tekahionwake. I am Ojistoh, I am she, the wife Of him whose name breathes bravery and life And courage to the tribe who calls him chief. I am Ojistoh, his white star, and he Is land, and lake, and sky-and soul to me.

As used in the text, what does the word "breathes" most nearly mean?
A. Absorbs
B. Rejects
C. Acquiesces
D. Imparts

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5) Bing Xie and her team have discovered that plains zebras make at least four types of vocalizations: "snorts," "soft snorts," "squeals," and "quagga quagga" calls. The researchers used machine-learning algorithms to_ recorded vocalizations according to type, finding that snorts vary across individual zebras, while squeals are more uniform across zebra populations.

Which choice completes the text with the most logical and precise word or phrase?
A. suppress
B. extend
C. collapse
D. Categorize

---

6) The following text is from Robert Lowell's 1964 poem "For the Union Dead." The South Boston Aquarium closed permanently in 1954. The old South Boston Aquarium stands in a Sahara of snow now. Its broken windows are boarded. The bronze weathervane cod has lost half its scales. The airy tanks are dry.

Which choice best states the main purpose of the text?
A. To contrast the effects of different kinds of weather on a building
B. To argue that a building should be rehabilitated
C. To describe details of the deteriorated state of a building
D. To explain why a once-popular building was abandoned

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7) Peter Pan is a 1911 novel by J.M. Barrie. In the fantasy novel, Peter is a young boy who can fly. He brings Wendy, John, and Michael to Neverland, the mythical island where he lives. The narrator suggests that activity on the island stops when Peter is away and starts again when he is about to return: _

Which quotation from Peter Pan best supports the claim?
A. "There is no entrance to be seen.
B. "Wendy and John and Michael stood on tip-toe in the air to get their first sight of the island."
C. "Feeling that Peter was on his way back, the Neverland had again woke into life."
D. "[Wendy] was often at the lagoon on sunny days after rain."

---

8) Understanding juvenile sea turtles' migratory patterns is crucial for conservation efforts. While adult sea turtles are well studied, little is known about juveniles during their oceanic stage, when they spend most of their time in the open ocean. To learn about this stage, researchers tagged and released six juvenile green sea turtles (Chelonia mydas) into the eastern Caribbean Sea. Their findings revealed that the majority of the turtles passively drifted with ocean currents throughout the region. However, two individuals swam against the currents, possibly in search of foraging grounds off the coast of South America.

Which choice best states the main purpose of the text?
A. To compare the behavior of adult and juvenile sea turtles during migration
B. To summarize research on an understudied stage of sea turtle development

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C. To suggest reasons why some juvenile sea turtles swim against the ocean currents
D. To describe successful conservation efforts for sea turtles

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9) All stainless steel contains varying amounts of iron, carbon, and corrosion-inhibiting chromium. However, ferritic stainless steel, often used for induction cookers, contains a higher percentage of chromium (at least 10.5%) than does austenitic stainless steel and a higher concentration of iron, which is responsible for its magnetic properties. Unlike ferritic stainless steel, austenitic stainless steel has a face-centered cubic crystalline structure resulting from the addition of nickel to the alloy. Austenitic stainless steel has two subtypes: the 200 series, often used for home water tanks, and the 300 series, which has more nickel than the 200 series and is often used for storage containers or sinks. Thus, stainless steel used to manufacture
Which choice most logically completes the text?
A. induction cookers will have a face-centered cubic crystalline structure.
B. home water tanks will have a lower percentage of chromium in its composition than stainless steel used for induction cookers will.
C. storage containers will have a concentration of chromium lower than 10.5%, while stainless steel used to manufacture home water tanks will not.
D. sinks will have similar magnetic properties to stainless steel used to manufacture induction cookers.

10)

Effect of Various Soil Treatments on Mean Pineapple Fruit Weight and Size

Soil treatment	Weight (grams)	Length (centimeters)	Diameter (centimeters)
Control	825.9	6.14	13.63
Biochar	915.7	6.56	13.63
Compost	864.8	6.15	13.22
Biochar and compost	979.3	6.76	13.68
Biochar and NPK fertilizer	1032.1	6.78	13.96

Working in Ghana, Emmanuel Hanyabui and colleagues compared the impact on pineapple growth of different combinations of soil additives, including NPK fertilizer (an inorganic fertilizer containing nitrogen, phosphorus, and potassium), organic compost, and biochar (a carbon-rich material produced from organic waste matter).

Based on data in the table, pineapple farmers with no access to inorganic soil additives would likely increase the weight and size of their fruits by the greatest amount by using.Which choice most effectively uses data from the table to complete the text?
A. biochar and compost.
B. biochar alone.
C. biochar and NPK fertilizer.
D. compost alone.

11) Linguist John McWhorter asserts that translation apps for smartphones and computers are-despite generally failing to convey many nuances-increasingly obviating the need to learn new languages. Advances in language processing technology have greatly boosted the utility of these apps for perfunctory tasks, like inquiring about an item on a menu, and passing interactions; be that as it may,

richer communication (e.g., in business dealings or meaningful personal exchanges) often hinges on conversational patterns and gradations of meaning.

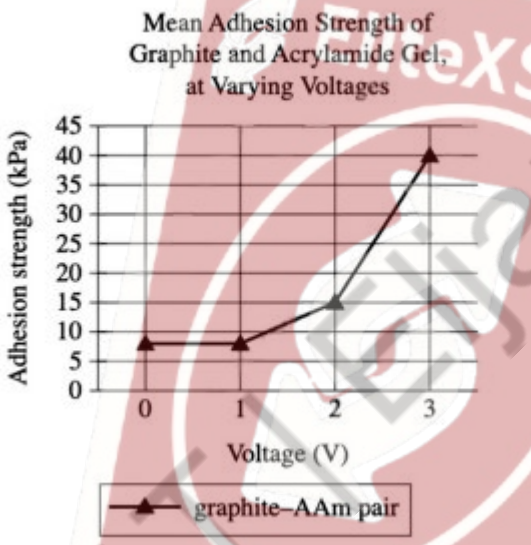
What does the text most directly suggest about translation apps?

A. They have improved remarkably over time but remain insufficient to support the complexity called for in certain interactions.

B. They have gained impressive capabilities but continue to be widely viewed as inadequate for most practical purposes.

C. They are becoming simpler to use but are inconsistent in how comprehensively they cover different languages.

D. They are coming to be embraced by international tourists but are viewed with skepticism by many business professionals.



12)

Wenhao Xu and colleagues demonstrated that applying a low direct current electrical field to graphite (a conductor) and an acrylamide (AAm) gel can increase how strongly materials adhere to each other. At some voltages, adhesion strength-as measured in kilopascals (kPa) of stress needed to pull the materials apart-was high (more than 30 kPa). But the mere application of a direct current electrical field with positive voltage is not sufficient to cause increased adhesion, as evidenced by the fact that

Which choice most effectively uses data from the graph to complete the statement?

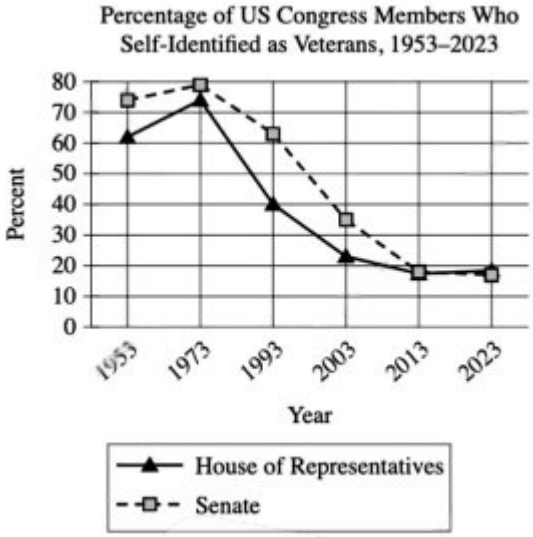
A. at 2 V, mean adhesion strength was lower than it was at both 1 V and 3 V.

B. at 3 V, mean adhesion strength reached its highest observed level at approximately 30 kPa.

C. at O V, mean adhesion strength was equal to 0 kPa.

D. at 1 V, mean adhesion strength was approximately equal to adhesion strength at 0 V.

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13)

Since the nation's earliest days, both houses of the United States Congress have counted many nany military veterans among their elected officials, including Hiram L. Fong (who served in the US Army Air Force) and Ralph Harold Metcalfe Sr. (who served in the US Army). A research institute gathered historical data about congressional members who have reported past military experience and determined that

Which choice most effectively uses data from the graph to complete the sentence?

A. from 2003 to 2023, the House of Representatives had a higher percentage of those members than the Senate did.

B. from 1953 to 2003, those members constituted a majority in both houses of Congress.

C. the percentage of those members decreased substantially in both houses of Congress from 1973 to 2013.

D. the percentage of those members remained fairly consistent, regardless of house, from 1993 to 2023

---

14)Outi Tervo and team studied the effect of human-caused noise on narwhals (Monodon monoceros), arctic marine mammals that are sensitive to acoustic changes in their environment. Hypothesizing that elevated sound levels affect foraging among narwhals, Tervo's team compared narwhal diving behaviors in natural sound conditions with those behaviors in two human-caused sound exposure conditions-ship sounds and ship sounds coupled with sonic pulses. Both exposure conditions resulted in significant decreases in the number and target depth of deep dives (associated with foraging) relative to natural conditions. However, differences between diving behaviors in the two exposure types were negligible, a finding that could be attributed to the fact that

Which choice most logically completes the text?

A. the narwhals weren't as sensitive to human-caused sounds as the researchers had predicted.

B. sonic pulses can be heard at significantly greater ocean depths than ship sounds can.

C. narwhals forage at shallower depths in the presence of ship sounds alone than in the presence of ship sounds coupled with sonic pulses.

D. ship sounds contribute so much to the overall sound level that the addition of sonic pulses has little effect on the narwhals' auditory environment.

---

15) Recordings of electrical activity in the brain, _ increased activity in brain areas associated with suppressing motor functions.

Which choice completes the text so that it conforms to the conventions of Standard English?
A. the most highly skilled soccer players responding to hypothetical match scenarios have electrograms that show
B. responses to hypothetical match scenarios show that the most highly skilled soccer players have electrograms with
C. electrograms show that while responding to hypothetical match scenarios, the most highly skilled soccer players have
D. hypothetical match scenario responses show that the most highly skilled soccer players captured in electrograms have

---

16) Bertie Marshall, a key figure in the history of steel band music in Trinidad and Tobago, made several innovations to the steel wheels so the instrument could be easily transported during Carnival, a cover to protect the pans from the sun, and amplification so the sound of the pans could be better heard over large crowds and other instrumentation.

Which choice completes the text so that it conforms to the conventions of Standard English?
A. drum,
B. drum;
C. drum
D. drum:

---

17) While some biologists cite the general lineage species concept (Queiroz 1998), others adhere to the biological species concept (Coyne and Orr 2004), with at least fourteen other concepts used across the field. Such lack of consensus, however, isn't necessarily cause for alarm. Scholars supporting a pluralist approach-in place of a single, monistic concept-to defining a species _ thata diversity of species concepts fits their equally diverse applications throughout the discipline.

Which choice completes the text so that it conforms to the conventions of Standard English?
A. is arguing
B. to argue
C. argue
D. Argues

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18)Brigadier General Virgilio Cordero was a soldier in the United States 65th Infantry Regiment, a Puerto Rico-based regiment of the US Army. In 2016, the United States Congress honored Cordero and the other servicepeople of the 65th Infantry Regiment with one of its highest Congressional Gold Medal.

Which choice completes the text so that it conforms to the conventions of Standard English?
A. honors; the
B. honors the
C. honors: the
D. honors (the

---

19) The city of Seoul, South Korea, is home to an office of the International Criminal Police Organization (Interpol). However, you won't see Interpol agents chasing international criminals in Seoul. Interpol can help with investigations, but only South Korean authorities permitted to make arrests there.

Which choice completes the text so that it conforms to the conventions of Standard English?
A. were
B. had been
C. are
D. were being

---

20) Astronomers Annie and Edward Maunder meticulously studied historical records of dark areas on the sun's surface known as sunspots. Their work in the late 1800s led to the identification of a period from 1645 to 1715-now known as the Maunder sunspots were notably scarce, a phenomenon that solar physicists continue to investigate.

Which choice completes the text so that it conforms to the conventions of Standard English?
A. Minimum-when
B. Minimum: when
C. Minimum, when
D. Minimum when

---

21) When ordering the branches of the Susitna River system, cartographers tend to begin with the riverway's lowest point, the Susitna River. _ hydrologists begin at the top of the river system, with the Skwentna River and other tributaries fed by the riverway's source, Alaska's Susitna Glacier.

Which choice completes the text with the most logical transition?
A. For example,
B. In other words,
C. In a similar way,

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D. By contrast,

22)Resins play several important roles in maintaining the health of conifers and many other kinds of trees. _ resins quickly seal wounds, which helps prevent harmful insects and fungi from entering trees. These sticky substances also help trees retain water that is needed for them to survive.

Which choice completes the text with the most logical transition?

A. However,

B. Regardless,

C. For example,

D. Next,

23) While researching a topic, a student has taken the following notes:

- Lighthouses send out crucial light signals to help ships and other watercraft navigate at night.

- Before automation, lighthouses were run by lighthouse keepers.
- Fannie May Salter was the lighthouse keeper at Turkey Point Light in Maryland.
- She held this position for twenty-two years (1925–1947). I
- da Lewis was the lighthouse keeper at Lime Rock Light in Rhode Island.
- She held this position for fifty-four years (1857–1911).

The student wants to compare the length of time Fannie May Salter and Ida Lewis worked as lighthouse keepers. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. Fannie May Salter and Ida Lewis were both lighthouse keepers at a time when such a person was needed to operate a lighthouse.

B. From 1925 to 1947, the nighttime waters of Maryland were more navigable thanks to lighthouse keepers Fannie May Salter and Ida Lewis.

C. Fannie May Salter worked as a lighthouse keeper for twenty-two years, but Ida Lewis did so for even longer: fifty-four years.

D. Before automation, lighthouse keepers like Fannie May Salter, who served for twenty-two years, and Ida Lewis were crucial to ensuring safe navigation for watercraft.

24) While researching a topic, a student has taken the following notes:

- Bert terHart is a Canadian sailor.
- Seaburban is a sailboat.
- terHart sailed Seaburban on a nonstop, 266-day journey around the world.
- Jesse Martin is an Australian sailor.
- Lionheart is a sailboat.

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- Martin sailed Lionheart on a nonstop, 328-day journey around the world.

The student wants to compare the durations of the two sailors' journeys. Which choice most effectively uses relevant information from the notes to accomplish this goal?
A. Both Martin and terHart embarked on sailing journeys around the world.
B. Martin's journey took place aboard Lionheart, while terHart sailed on Seaburban.
C. Canadian sailor Bert terHart sailed Seaburban around the world in 266 days.
D. Martin's 328-day journey around the world took longer than terHart's 266-day journey.

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25) While researching a topic, a student has taken the following notes:

- The waved albatross is a species of bird found in the Galápagos Islands.
- It has an average weight of 3,800 grams.
- The vegetarian finch is a species of bird found in the Galápagos Islands.
- It has an average weight of 34 grams.

The student wants to emphasize a difference between the two bird species. Which choice most effectively uses relevant information from the notes to accomplish this goal?
A. On average, the waved albatross weighs 3,800 grams, while the vegetarian finch weighs only 34 grams.
B. The vegetarian finch and the waved albatross can be found in the Galápagos Islands.
C. The waved albatross is a bird with an average weight of 3,800 grams.
D. The vegetarian finch and the waved albatross are both bird species.

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26) While researching a topic, a student has taken the following notes:

- Usually, a country's capital is also its largest city by population.
- The capital of Kazakhstan is Nur-Sultan.
- Its largest city by population is Almaty.
- The capital of New Zealand is Wellington.
- Its largest city by population is Auckland.

The student wants to emphasize a similarity between Almaty and Auckland. Which choice most effectively uses relevant information from the notes to accomplish this goal?
A. While Almaty is in Kazakhstan, Auckland is in New Zealand.
B. The capital of Kazakhstan is Nur-Sultan; the capital of New Zealand is Wellington.
C. Although neither is a capital city, both Almaty and Auckland are the most populous cities in their countries.
D. The most populous city in Kazakhstan is Almaty, but its capital is Nur-Sultan.

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27) While researching a topic, a student has taken the following notes:

- The human tongue contains taste receptors for a rich, savory flavor called umami.
- Umami is triggered by the compounds in a variety of foods, including tuna and blue cheese.
- Participants in a study tasted a sample of sea palm, a type of brown seaweed.
- They rated its umami intensity as moderate.
- The participants tasted a sample of bull kelp, another type of brown seaweed.
- They rated its umami intensity as high.

The student wants to emphasize a difference between the two seaweeds. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. After tasting two types of brown seaweed, sea palm and bull kelp, participants in a study found bull kelp's umami flavor to be the more intense of the two.

B. While sea palm and bull kelp contain umami flavor, umami can also be found in tuna and blue cheese.

C. Sea palm is a type of brown seaweed, but so is bull kelp.

D. Some types of brown seaweed, like sea palm and bull kelp, trigger umami flavor in human taste buds

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Section 1, Module 2: Reading And Writing

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1) If some specific predictions in Alvin Toffler's 1970 book Future Shock seem ludicrous now-people do not wear paper clothing while living in underwater cities-Toffler's fundamental claim that rapid technological and social change will leave people feeling disoriented and atomized seems, in our age of disequilibrium and fragmentation, remarkably

Which choice completes the text with the most logical and precise word or phrase?
A. equivocal
B. articulate
C. iconoclastic
D. Prescient

---

2) The Yupno people of the remote Finisterre Range of Papua New Guinea do not measure age and have no artificial means (e.g., clocks) of tracking time, but this does not imply that the Yupno are time. As Rafael Núñez and colleagues have recently shown, the Yupno language contains many temporal expressions, such as usa-don sonda, which translates to "next week."

Which choice completes the text with the most logical and precise word or phrase?
A. dependent on
B. meticulous about
C. inattentive to
D. preoccupied with

---

3) Exposed to harsh environmental conditions for centuries, lighthouses such as La Jument lighthouse off the coast of Brittany, France, exemplify the _ between marine structures and ocean forces: the continuous impact of breaking waves necessitates periodic reinforcements to or redesigns of the structures that in turn may alter local wave patterns.

Which choice completes the text with the most logical and precise word or phrase?

A. interplay

B. incongruity

C. tension

D. continuum

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4) Establishing protected areas (PAs), such as South Luangwa National Park in Zambia, is a common conservation strategy, but because PAs restrict some kinds of economic activity, it's widely thought that they hinder economic development. This perception is driven in part by the fact that economic assessments often don't capture the indirect effects of tourism linked to PAs. But Hasita Bhammar et al. found that tourism associated with South Luangwa boosts local demand for goods and services in other economic sectors, resulting in, for instance, increased income from livestock production in nearby areas.

Which choice best describes the overall structure of the text?

A. It makes a generalization about the difficulty of using PAs to reconcile economic and conservation priorities, demonstrates why most PAs fall short of achieving that goal, and then holds up a particular PA as an example of how that goal can be achieved.

B. It explains how PAs typically affect economic development in the regions where they are established, summarizes the findings of several economic studies that support this explanation, and then concedes that a particular PA is an exception to the general trend.

C. It introduces a widely held belief about the effect PAs have on the economy, proposes a reason for that belief's prevalence, and then details a study whose findings seemingly conflict with that belief.

D. It states a hypothesis that accounts for why PAs generally negatively impact local economies, outlines how a research team's findings support that hypothesis, and then suggests how a novel methodology led a separate team of researchers to a different conclusion.

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5) Pablo Picasso famously subverted the norms of traditional painting: in his cubist paintings he refused to let his expression be constrained, fragmenting objects and figures to present multiple perspectives simultaneously. Though less widely known, Picasso-who once lamented that writers of his time had "limited themselves to moving around words somewhat while respecting the syntax"-also wrote poetry that defied conventional grammar, semantic relationships, and text structure. Thus, the paintings and poems are linked in that

Which choice most logically completes the text?

A. the poems are intended to be understood as explanations of the artistic inclinations reflected in the paintings.

B. the poems present many of the same subjects as the paintings but with different thematic approaches.

C. both exhibit Picasso's prioritization of creative expression over the standard rules of the art forms.

D. both types of work are characterized by the simultaneous representation of multiple points of view that Picasso is known for.

---

6) The presence of other individuals of the same species has been observed to mitigate stress in highly social mammals. To investigate whether this phenomenon, known as social buffering, also occurs in reptiles, researchers led by Chelsea E. Martin monitored stress responses in wild southern Pacific rattlesnakes (Crotalus helleri) in three experimental treatments: when alone, with a rope, and with a

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companion C. helleri. The researchers compared the percent change between baseline and peak heart rate in response to a (harmless) disturbance, with higher values indicating higher stress levels.

Which finding, if true, would most directly support the idea that social buffering occurs among C. helleri?

A. Solitary C. helleri had higher average baseline heart rates than did C. helleri in the other treatments, but the average percent change in heart rate was smaller among solitary C. helleri than among C. helleri with a companion.

B. Average peak heart rates were highest among solitary C. helleri, but no differences were observed in average peak heart rates between C. helleri with a companion and C. helleri with a rope.

C. C. helleri with a companion displayed a lower average baseline heart rate and lower average peak heart rate than did solitary C. helleri or C. helleri with a rope.

D. The average percent change in heart rate was lower among C. helleri with a companion than among solitary C. helleri and C. helleri with a rope.

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7) Variously, researchers have closely examined obsidian artifacts to understand ancient social and economic structures, as in Raymond V. Sidrys's 1976 study, or to glean aspects of cultural identity, as in M. Steven Shackley's 2002 study. Studies of the Malia archaeological site on the Mediterranean island of Crete have shown that significant changes to building styles-changes consistent with an influx of people from another culture elsewhere in the Mediterranean-occurred from the Middle Bronze Age to the Late Bronze Age. In a 2022 study, however, Tristan Carter and Vassilis Kilikoglou found that obsidianobject production methods at Malia stayed remarkably consistent during this architectural transition, which they interpret as indicative of local cultural continuity in the Middle and Late Bronze Ages.

Which finding, if true, would most directly weaken Carter and Kilikoglou's argument?

A. The obsidian used to produce objects at Malia was transported to Crete from the same source elsewhere in the Mediterranean throughout the Middle and Late Bronze Ages.

B. The obsidian-object production method that was most common among other Mediterranean cultures during the Middle and Late Bronze Ages was more efficient than the method used at Malia.

C. The methods used to produce obsidian objects at Malia during the Middle and Late Bronze Ages were also used by some other Mediterranean cultures in the period.

D. Changes to buildings like those that occurred at Malia have not been linked to changes in obsidian-object production methods in other Mediterranean cultures during the Middle and Late Bronze Ages.

---

8) Text 1 Good art often challenges and disrupts social and aesthetic norms, but the creation of public artpaintings, sculptures, and performance pieces displayed in nonmuseum or nontheatrical public settings -typically requires broad agreement among artists, civic officials, and community members about the works' message and artistic goals. Public art that fails to appease everyone by being sufficiently aesthetically and conceptually bland almost inevitably provokes backlash.

Text 2 Public art is commonly displayed in spaces intended for purposes other than meaningful aesthetic engagement. Some critics of public art therefore note that norm-defying pieces that aren't effectively integrated within their surroundings in a manner that primes passersby to appreciate the pieces' merits (as is often the case) tend to be regarded more unfavorably than similarly provocative art encountered in museums is.

Based on the texts, how would the critics mentioned in Text 2 most likely respond to the underlined claim in Text 1?

A. By arguing that the reason members of the general public might disagree about a public artwork's merits is unrelated to the unconventionality of its appearance and ideas

B. By disputing the notion that civic leaders and community members are easily placated by art that is intended mainly to reinforce social norms

C. By agreeing with the idea that only works of art that are universally appealing are suitable for displaying in public spaces

D. By contending that the kinds of reactions controversial public artworks often receive aren't exclusively the result of attributes inherent in the works themselves

---

9) Tomi Adeyemi's first published work, the inventive West African-inspired fantasy novel Children of Blood and Bone, has intriguing things to say about the relationship between identity and power. Adeyemi works in a decades-long tradition going back to writers such as Samuel Delany and Octavia Butler, who wove cultural elements of the Black diaspora into their science fiction and fantasy in a movement known as Afrofuturism. At its core, the movement is characterized by speculation, not just about distant futures or other planets but also about alternate versions of our shared past. Afrofuturism's meditations on authority reinvigorate the creative potential of fiction.

Which choice best describes the overall structure of the text?

A. It praises a newly published author, compares that author with others who might appear superficially similar, and then points out the features of that author's work that make it unique.

B. It notes the political stance of an author, compares that author's book to other earlier works, and then analyzes the influence of political events on the book.

C. It summarizes a book, describes characteristics of the artistic movement of which the book is a part, and then points out the features the book shares with more widely read works.

D. It introduces an intriguing debut work, contextualizes that work as part of an ongoing literary tradition, and then describes important themes of that tradition.

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10) The following text is adapted from Mark Twain's 1876 novel The Adventures of Tom Sawyer. Aunt Polly is having dinner with Tom, her mischievous young nephew. Aunt Polly asked [Tom] questions that were full of guile, and very deep-for she wanted to trap him into damaging revealments. Like many other simple-hearted souls, it was her pet vanity to believe she was endowed with a talent for dark and mysterious diplomacy, and she loved to contemplate her most transparent devices as marvels of low cunning.

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Which choice best describes how Aunt Polly is presented in the text?

A. The narrator characterizes Aunt Polly as being excessively nosy about other people's private lives.

B. The narrator emphasizes that Aunt Polly's intentions are good even when her behavior is rude.

C. The narrator gently makes fun of Aunt Polly's mistaken confidence in her subtlety.

D. The narrator humorously exaggerates Aunt Polly's view of herself as an intellectual.

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11) From steel production to fuel for residential heating, hydrogen has many applications. Currently, producing hydrogen is carbon intensive, but Rebecca R. Beswick is one of many scholars investigating the feasibility of large-scale production of hydrogen through electrolysis, a process that emits no carbon when renewable energy is used. Beswick suggests that although some obstacles may prevent electrolytic hydrogen from dominating energy systems, there is utility in its ability to decarbonize the steel and heating industries, where reducing carbon emissions is especially challenging.

Which statement about the use of hydrogen in the steel and heating industries is most strongly supported by the text?

A. Development of applications for electrolytic hydrogen is less advanced in these industries than it is in most other carbon-intensive industries.

B. The fact that large-scale electrolytic hydrogen production is not yet available has limited these industries' interest in pursuing hydrogen-based applications.

C. The adoption of electrolytic hydrogen by these industries has been impeded by concerns about how carbon intensive its production is.

D. At least some of electrolytic hydrogen's potential to lessen these industries' carbon emissions is as yet unrealized.

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12) Most Native languages belong to language families, or groups of languages whose structural and lexical correspondence likely derives from their descent from a single language spoken long ago. A minoritysuch as Zuni, which is spoken in New Mexico, and Haida, which is spoken in Alaska—are isolates, having no demonstrable genealogical relationship to other languages. Yet Zuni and Haida, like all isolates, are potentially remnants of families whose other members vanished before the historical record could attest to them, perhaps through the geographical expansion of extant families.

Which choice best describes the function of the underlined sentence in the text as a whole?

A. It implies that a nonisolate language may have influenced both Zuni and Haida to such a degree that their relationship to their former families is no longer discernible.

B. It asserts that the historical record tends to overrepresent nonisolate languages relative to isolates, such that the origins of Zuni and Haida are obscure to scholars in the present day.

C. It suggests that the ancestral languages of both Zuni and Haida were likely isolates that replaced nonisolate languages through geographic expansion in the distant past.

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D. It proposes that the distinction made between present-day nonisolate languages and isolates like Zuni and Haida may not have been applicable in the distant past.

13) Duckweed is a small freshwater plant that is often exposed to zinc pollution. Sofia Vámos and colleagues collected samples of four duckweed ecotypes (genetically and geographically distinct populations within a species), along with water from each ecotype's habitat. Hypothesizing that each ecotype is adapted to its local conditions in ways that bolster its growth and resistance to pollutants, the researchers grew each ecotype in all four water samples and with three levels of zinc (none, low, high). (The researchers did not replicate local differences in light or temperature.) They found that the ecotypes grew equally well in all four water samples and that adding zinc consistently enhanced growth, regardless of concentration, suggesting that

Which choice most logically completes the text?

A. if each ecotype is indeed locally adapted as the researchers hypothesized, those adaptations are to other environmental conditions than the water each ecotype inhabits.

B. there may not be significant differences in the water that each ecotype inhabits, but there are significant differences in each ecotype's resistance to zinc pollution.

C. although the researchers' hypothesis does not appear to be supported, this may be because the levels of zinc exposure the plants in the experiment received did not match their exposure in their natural environments.

D. while the ecotypes are genetically and geographically distinct, those differences do not represent adaptations to local environmental conditions.

14) In 2001, the US state of Oklahoma enacted rate stability regulations (RSRs), constraining insurance companies' latitude to raise premiums (the recurring fees policyholders pay to maintain insurance policies) once policies are in effect. Although RSRs are intended to benefit consumers, Naoki Aizawa and Ami Ko note that RSRs could curtail insurers' profits to such a degree that insurers abandon the market, thereby reducing the competitive pressure that typically restrains premium prices for newly issued policies. To determine whether this occurred in Oklahoma, students first collect data on the number of insurers in the state for a few years leading up to and following 2001 and the premium prices for new policies offered by those insurers.

Based on the text, what would be the most reasonable next step for the students to take to accomplish their goal?

A. Compare changes over time within each of the two types of data the students have collected with changes over time in analogous data for the same period from an otherwise similar state that had not enacted RSRS

B. Compare changes over time in the insurer-number data the students have collected with changes over time in insurer-number data from another state that enacted RSRs but not during the same period

C. Compare changes over time within each of the two types of data the students have collected with changes over time in the same types of data from Oklahoma for a period beginning several years after 2001

D. Compare changes over time in the premium price data the students have collected with changes over time in premium prices for policies that were already in effect during the same period in an otherwise similar state that had not enacted RSRS

---

15) On Guard is a 1997 photograph by Iranian artist Shirin Neshat. Like many of Neshat's photos, the work featuresa pair of hands. Clasping a microphone, one hand _ covered in Persian script, the hands imply an out-of-frame figure on the edge of speaking.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. is bare, the other

B. is bare and the other is

C. bare and the other

D. bare, the other is

---

16) In the eastern Chinese city of Suzhou, known as a hub for silk manufacturing, a unique tradition of embroidery back over two thousand years-one that includes iconic double-sided stitching with different images on each side-remains popular with modern audiences, preserving the city's cultural heritage.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. dates

B. date

C. has dated

D. dating

---

17) On December 2, 1992, the space shuttle Discovery blasted off into space, commencing Mission seven days and seven hours, the mission ended when the shuttle landed at Edwards Air Force Base in California.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. STS-53, it lasted

B. STS-53. Lasting

C. STS-53, lasting

D. STS-53 lasting

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18) The exoplanet Kapteyn c was discovered using an indirect approach to planetary detection, the radial velocity method. Compared to that of the direct imaging method, _ the effect these exoplanets have on nearby stars.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. the radial velocity method's zone of discovery is vast, as distant exoplanets too dim to be observed are detected by

B. distant exoplanets too dim to be observed are detected within the radial velocity method's vast zone of discovery through

C. the radial velocity method, with its vast zone of discovery, detects exoplanets that are too dim to be observed by

D. the detection of distant exoplanets, too dim to be observed in the radial velocity method's vast zone of discovery, is based on

---

19) To British musician Jacob Collier, substituting the iii7 chord for the bVI6 chord-its opposite in pitch and tone-adds expression to improvisation without creating dissonance. This conceptualization of harmonic opposites did not originate with _ in 1985, the idea was first articulated in Swiss musicologist Ernst Levy's posthumously published book A Theory of Harmony.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. Collier, though,

B. Collier, though

C. Collier, though;

D. Collier; though,

---

20) Many works of the Greek poet Nicander (2nd century BCE) are _ his Theriaca, a poem about venomous animals, is an extant work: it can still be read.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. lost, conversely.

B. lost, and conversely

C. lost. Conversely,

D. lost and conversely,

---

21) The Republic of Pisa, a sea power based in the Mediterranean port city of Pisa that reached its height around 1100 CE, is considered a thalassocracy—a geopolitical entity whose hegemony resulted from control of the sea rather than of land. Historians classify thalassocracies as distinct from

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tellurocracies, or land-based powers. _ the British Empire (1600s-1900s CE) is known for both land and sea supremacy.

Which choice completes the text with the most logical transition?

A. In other words, empires are classified according to their source of power:

B. For example, tellurocracies have long overpowered their rivals:

C. Of course, the distinction is not always so neat:

D. Likewise, thalassocracies are sea-based powers:

---

22) Brain imaging research led by neuroscientist Dwaynica Greaves found that actors showed suppressed responses in the left anterior prefrontal cortex (the portion of the brain associated with self-awareness) when their names were called during performances; _ the actors' responses were normal in nonacting contexts. These findings suggest that when embodying characters, performers may temporarily set aside their personal identities.

Which choice completes the text with the most logical transition?

A. thus,

B. likewise,

C. conversely,

D. specifically,

---

23) Nineteenth-century Modernista architects championed nature in their designs. Granted, the domed rooftop and painted floral designs of Casa Estapé, a Modernista private home designed by Bernardí Martorell i Rius, couldn't exactly grow in a forest. _ one sees natural influences in Martorell i Rius's penchant for curves (rather than right angles) and plant- and animal-inspired flourishes.

Which choice completes the text with the most logical transition?

A. Still,

B. Similarly,

C. Furthermore,

D. In other words,

---

24) Though its onboard laboratory allowed it to analyze rock samples on-site, the 2011 Mars Curiosity rover was unable to preserve samples for future analysis. _ when creating the 2020 Mars Perseverance rover, electrical engineer Dania Lazo and other members of NASA's Jet Propulsion Laboratory sought to implement a mechanism that could do exactly that.

Which choice completes the text with the most logical transition?

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A. Specifically,

B. Earlier,

C. Similarly,

D. Hence,

---

25) While researching a topic, a student has taken the following notes:

- In the Electoral College system that determines the outcome of US presidential elections, the winner of Minnesota's popular vote receives all 10 of Minnesota's electoral votes.
- A 2001 article written by law professors Akhil and Vikram Amar proposed that states could instead agree to award their electoral votes to the winner of the national popular vote.
- The Amars' idea is the basis of the National Popular Vote Interstate Compact (NPVIC).
- If states holding a majority of electoral college votes (270) adopt the NPVIC, the compact will take effect and adopters will award their electoral votes accordingly.
- Minnesota adopted the NPVIC in 2023.

The student wants to explain the significance of Minnesota's NPVIC adoption. Which choice most effectively uses relevant information from the notes to accomplish this goal?
A. Because it has adopted the NPVIC, Minnesota will award its electoral votes to the winner of the state's popular vote-once states holding a majority of electoral college votes (270) do the same.
B. According to the idea proposed by the Amars, the winner of Minnesota's popular vote will receive all of the state's electoral votes if the NPVIC takes effect.
C. If the NPVIC takes effect, adopter Minnesota will award all 10 of its electoral votes to the winner of the national, rather than the state's, popular vote.
D. An agreement among US states to award their electoral votes to the presidential candidate who wins the national popular vote was adopted by Minnesota in 2023.

---

26) While researching a topic, a student has taken the following notes:

- Melissa Cody is a Diné (Navajo) textile artist known for blending traditional Diné designs (stripes, zigzags, and diamond patterns) with nontraditional elements.
- Cody's work incorporates arrangements of shapes or text inspired by video game graphics and pop culture references.
- Cody: "I'm a child of '80s video game culture…I grew up with this world of pixelization."
- Cody: "The things we consider tradition now weren't considered tradition when they first came about."
- Her tapestry Rainbow Road features words in a blocky digital font surrounded by a pattern of colored diamonds.
- Her tapestry Lightning Storm features a blank column of undyed wool next to a blue zigzag stripe.

The student wants to connect a quotation to a particular nontraditional design element in Cody's work. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. The words in a blocky digital font in Rainbow Road reflect Cody's childhood familiarity with blocky video game graphics-what she calls "this world of pixelization."

B. Cody's background as "a child of '80s video game culture" factored into her decision to blend traditional and nontraditional design elements in Lightning Storm.

C. Cody's tapestry Rainbow Road featuresa pattern of colored diamonds, a traditional design element that "we consider tradition now."

D. According to Cody, some elements of Lightning Storm, such as a blue zigzag stripe, "weren't considered tradition when they first came about."

---

27) While researching a topic, a student has taken the following notes:

- The farm-size transition hypothesis predicts that economic pressures associated with modernization result in smaller farms amalgamating into larger-scale commercial farms.
- Masters et al. (2013): The average farm size in Asia "already has or will soon begin to rise."
- Promkhambut et al. (2023) argue that small rice farms in Thailand have adopted modern farming methods without a significant scaling-up of farm size.
- Promkhambut et al.: "The persistence of [small] rice farms [in Thailand] does not represent a 'failure' to modernize...or a 'truncated' transition-it is a response to modernization."

The student wants to make and support a claim regarding the applicability of the farm-size transition hypothesis to Thailand. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. Masters et al. report that the average farm size "already has or will soon begin to rise" in Asia, a finding that is consistent with the farm-size transition hypothesis.

B. The predicted shift to large-scale commercial farming may not hold true for rice farms in Thailand, where, according to Promkhambut et al., rice farms have remained small as they've modernized.

C. Taken together, the studies by Masters et al. and Promkhambut et al. suggest that rice farms in Thailand have responded to the economic pressures associated with modernization by expanding in size.

D. Although the farm-size transition hypothesis may be applicable to some countries in Asia, it is inconsistent with the development of rice farming in Thailand.

November US-A Math M1

1) The measures of the interior angles of triangle ABC are 41°, 82°, and x°. What is the value of x?

A. 123
B. 180
C. 41
D. 57

---

2) What is a positive solution to the given equation?
$(x – 14)(x – 12)(x + 5)(x + 17) = 0$

---

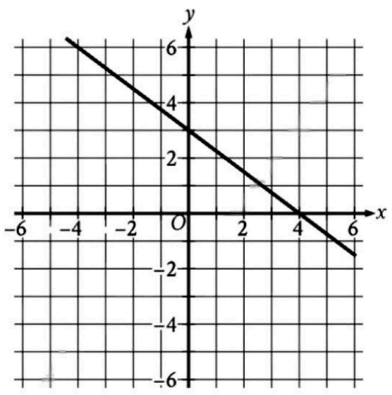
3) In the given equations, p is a positive constant. Which statement correctly compares the graphs of circles A and B in the xy-plane?
Circle A: $(x – 9)^2 + (y – p)^2 = 24$
Circle B: $(x + 9)^2 + (y – p)^2 = 24$

A. Circle B is the reflection of circle A across the x-axis.
B. Circle B is the reflection of circle A across the y-axis.
C. Circle B is the translation of circle A 18 units to the right.
D. Circle B is the translation of circle A 18 units up.

---

4) A bottle has 310 marbles, and 20% of these marbles are blue. How many marbles in the bottle are blue?

A. 62
B. 124
C. 290
D. 155



5) Line k is shown in the xy-plane. Line ***j*** (not shown) is perpendicular to line ***k*** and passes through the point (–15, –29). Which equation defines line ***j***?

A.y = 3/4x – 49
B. y = 3/4x – 9
C. y= 4/3x – 9
D. y= 4/3x – 49

James purchased a certain baseball card on January 1. The function $f(x) = 75(1.04)^x$, where $0 \leq x \leq 10$, gives the predicted value, in dollars, of the baseball card x years after James purchased it. What is the best interpretation of the statement "$f(6)$ is approximately equal to 95" in this context?

6)
A. 6 years after James purchased the baseball card, its predicted value is approximately 95 dollars.
B. When the baseball card's predicted value is approximately 95 dollars, it is 6% greater than the predicted value, in dollars, on January 1 of the previous year.
C. When the baseball card's predicted value is approximately 95 dollars, it is 6 times the predicted value, in dollars, on January 1 of the previous year.
D. From the day James purchased the baseball card to 6 years after James purchased the card, its predicted value increased by a total of approximately 95 dollars.

---

7) During a trip, Bill drove his car for 14.0 miles and then began driving at a constant speed of 70.0 miles per hour. After 2 hours of driving at this speed, what is the total distance, in miles, Bill has traveled during this trip?

---

8) How many solutions does the given system of equations have?
$3x + 5y = 8$
$9x + 15y = 24$

A. Zero
B. Exactly two
C. Exactly one
D. Infinitely many

---

9) If $4x - 10 = 6$, what is the value of $4x + 10$?

A. 26
B. –4
C. 4
D. 14

---

10) A solution to the given system of equations is (x, y), where < 0. What is the value of ***y***?

$x^2 + y^2 = 153$

$y - 4x = 0$

A. –4
B. –3
C. –36
D. –12

---

11) The length of a side of square A is 8 centimeters. The area of rectangle B is 28 square centimeters. What is the total area, in square centimeters, of square A and rectangle B?

A. 64
B. 120
C. 92
D. 72

One of the factors of $6x^4 + 29x^2 + 28$ is $ax^2 + b$, where a and b are positive constants. Which of the following is a possible value of ab?

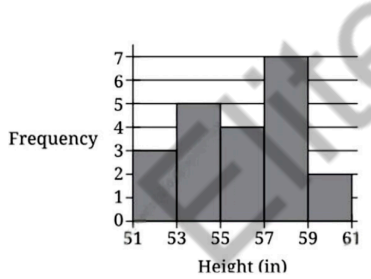
12)
A. 8
B. 21
C. 7
D. 12

---

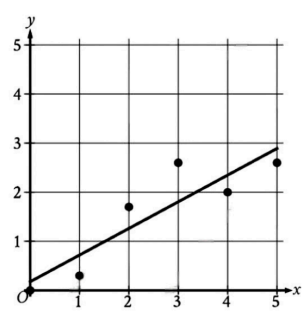
13) If the graph of the given equation is shifted up 9 units in the xy-plane, what is the y-intercept of the resulting graph?

$4x + 5y = 18$

A. (0, 63/5)
B. (0, 27)
C. (0, 18/5)
D. (0, 41/5)



14) For a project, Kayla recorded the heights of 21 people in her neighborhood. The histogram summarizes the heights, in inches (in), of these 21 people in Kayla's neighborhood. The first bar represents people with a height of at least 51 in but less than 53 in. The second bar represents people with a height of at least 53 in but less than 55 in, and so on. How many of these 21 people in Kayla's neighborhood had a height of at least 51 in but less than 55 in ?



15) The scatterplot shows the relationship between and y. A line of best fit is also shown. Which of the following is closest to the slope of the line of best fit shown?

A. –1.84
B. –0.54
C. 0.54
D. 1.84

---

16) The equation $54 = 2x + 2y$ gives the perimeter of a rectangular garden that has length ***x***, in feet, and width ***y***, in feet. The width of the garden is 12 feet. What is the length, in feet, of the garden?

17) A beekeeper's initial observation of the population of a certain bee colony was 1,900 bees. The beekeeper set a goal to increase the population to 3,025 bees. The beekeeper uses a model that predicts the population of this bee colony begins at 1,900 and increases by 90 bees per week in the first two weeks after the initial observation, and then increases by 135 bees per week until the beekeeper's goal is reached. According to this model, at the end of week ***w*** after the initial observation, where ***w*** > 2, which of the following functions gives the predicted number of bees still needed to reach the beekeeper's goal?

A. p(w) = 2,935 + 135w
B. p(w) = 3,025 – 135w
C. p(w) = −90 + 135w
D. p(w) = 1,215 – 135w

---

18) The function ***h*** estimates an object's height, in feet, above the ground ***t*** seconds after the object is dropped, where ***b*** is a constant. The function estimates that the object is 6.76 feet above the ground when it is dropped at ***t*** = 0. How many seconds after being dropped does the function estimate the object will hit the ground?

$h(t) = -16t^2 + b$

---

19) The functions ***f***, ***g***, and ***h*** are defined as shown. If $f(x) \cdot g(x) - h(x) = ax^2 + bx + c$, where ***a***, ***b***, and ***c*** are constants, what is the value of ***b***?

$f(x) = 2x + 5$
$g(x) = 5x - 4$
$h(x) = 2x + 3$

A. –2
B. 31
C. 15
D. 19

---

20) The function ***g*** is defined by $g(x) = (x + 18)(t - x)$, where t is a constant. In the xy-plane, the graph of $y = g(x)$ passes through the point (22, 0). What is the value of ***g(0)***?

---

21) For two acute angles X and Y, the measure of angle Y is 28° and sinX/sinY = 1. What is the measure, in degrees, of angle X?

A. 28
B. 73
C. 45
D. 62

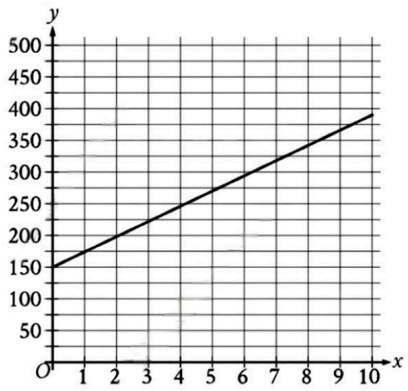
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22) A survey was conducted in Arlington to estimate the percent of adult residents who support the addition of a gas station at a popular intersection in their town. Based on the survey, it is estimated that 51% of all adult residents of Arlington support the addition of a gas station at a popular intersection in their town, with an associated margin of error of 7%. Which of the following is the most appropriate conclusion about all adult residents of Arlington?

A. The addition of a gas station at a popular intersection in the town is supported by more than 58% of all adult residents of Arlington.
B. Plausible values for the percent of all adult residents of Arlington who support the addition of a gas station at a popular intersection in their town are between 44% and 58%.
C. Plausible values for the percent of all adult residents of Arlington who support the addition of a gas station at a popular intersection in their town are either less than 44% or more than 58%.
D. The addition of a gas station at a popular intersection in the town is supported by exactly 44% of all adult residents of Arlington.

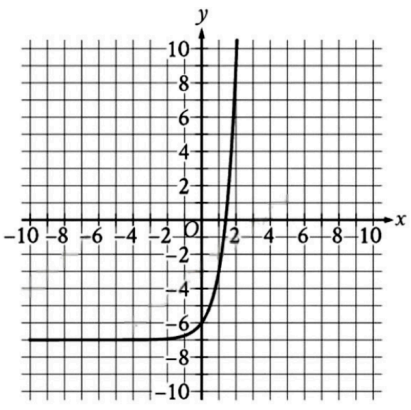
November US-A Math M2

1) A car dealership has only sedans, SUVs, and minivans for sale. On Monday, 30% of the vehicles for sale were sedans and 50% were SUVs. If there were 18 sedans for sale at the dealership on Monday, how many minivans were for sale?



2) The graph of the function ***f***, where *y = f(x)*, gives the total cost ***y***, in dollars, for a certain video game system and ***x*** games. What is the best interpretation of the slope of the graph in this context?

A. Each game costs $150.
B. The video game system costs $24.
C. The video game system costs $150.
D. Each game costs $24.



3) The graph of the equation $y = 4^x + k$ is shown, where k is a constant. What is the value of k?

A. –6
B. –7
C. 6
D. 7

---

4) Line t in the xy-plane has a slope of ⅕ and passes through the point (15, –9). Which equation defines line ***t***?

A. y = –12x + 1/5
B. y = x/5 – 9
C. y = 15x – 9
D. y = x/5 – 12

---

5) A machine makes 9-inch, 4-inch, and 7-inch parts. During a certain day, the number of 9-inch parts that the machine makes is 3 times the number n of 4-inch parts, and the number of 7-inch parts is 12. During this day, the machine makes 100 parts total. Which equation represents this situation?

A. 9n + 4n +7n = 100
B. 4n + 12 = 100
C. 9(3n) + 4n + 7(12) = 100
D. 3n + 12= 100

---

6) In triangle *RST*, the measure of angle *R* is 49°, the measure of angle *S* is x°, and the measure of angle *T* is (7x – 5)°. Point *L* lies on RS, point *K* lies on ST, and LK is parallel to RT. What is the measure, in degrees, of angle *SKL*?

---

7) Which point (x, y) is a solution to the given system of inequalities in the xy-plane?

$y \geq x + 9$
$y \leq -8x - 6$

A. (–3, 10)
B. (–3,5)
C. (–1,5)
D. (–1,10)

---

8) A circle in the xy-plane has its center at (35) and has a radius of length 7. Which equation represents this circle?

A. $(x + 3)^2 + (y + 5)^2 = 49$
B. $(x - 3)^2 + (y - 5)^2 = 49$
C. $(x - 3)^2 + (y - 5)^2 = 7$
D. $(x + 3)^2 + (y + 5)^2 = 7$

9) The table gives the areas and perimeters of two similar rectangles, where n is a constant.

X	Area	Perimeter
Rectangle A	540	180
Rectangle B	2160	***n***

What is the value of *n*?

---

10) **The function h is defined by $h(x) = \frac{10x^2}{x^2-9k^2} - \frac{5x}{x+3k}$, where k is a positive constant. What is the value of $h\left(\frac{21k}{8}\right)$?**

A. –5/3
B. –35/12
C. –14
D. –35

---

11) The functions f and g are defined by the given equations, where x ≥ 0, a and b are integer constants, a < b, and a > 1. If *y = f (x)* and *y = g(x)* are graphed in the xy-plane, which of the following equations displays, as a constant or coefficient, the minimum value of the function it defines, where x ≥ 0?

I. $f(x) = a(0.48)^{-bx}$
II. $g(x) = a(1.52)^{x+2} + b$

A. I and II
B. II only
C. Neither I nor II
D. I only

---

12) How many solutions does the equation *3(x + 12) + 9x = 12(x + 3)* have?

A. Infinitely many
B. Exactly one
C. Exactly two
D. Zero

$\frac{1}{3}x^2 - 7x + k = 4$

In the given equation, k is a constant. A solution to the equation is $\frac{21}{2} - \frac{3\sqrt{69}}{2}$. What is the value of k?

13) A. –11 B. 11
C. –15 D. 4

---

14) In a set of four consecutive odd integers, where the integers are ordered from least to greatest, the first integer is represented by ***x***. The product of 28 and the third odd integer in the set is at most the value of 50 less than the sum of the first and fourth odd integers in the set. What is the greatest possible value of ***x***?

---

15) The quadratic equation $(6x - 16)^2 = a$, where *a* is a constant, has exactly one real solution. What is the value of a?

---

16) The solution to the given system of equations is (x, y). What is the value of y?

$x + y = 105$
$x + 2y = 185$

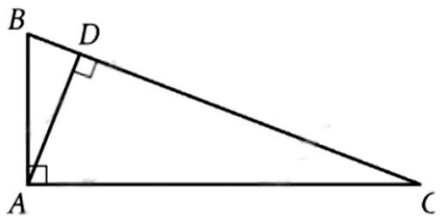
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17) An area of 55.00 square nautical miles is equivalent to ***k*** square kilometers. To the nearest tenth, what is the value of ***k***?
(1 nautical mile = 1.852 kilometers)

---

18) In 2012, Chloe earned 17% more than in 2011, and in 2013 Chloe earned 3% more than in 2012. If Chloe earned y times as much in 2011 as in 2013, which of the following is closest to the value of y?

A. 1.2051
B. 0.1765
C. 0.8298
D. 0.5100



Note: Figure not drawn to scale.

19) In the figure, $\overline{AD}$ and $\overline{BC}$ intersect at point D. The measure of $\angle ABD$ is w°, the measure of $\angle CAD$ is z°, and $AD = 186$. If $\cos w^\circ = \frac{9}{41}$, what is the value of $\tan z^\circ$?

---

20) Which of the following expressions is(are) a factor of $3x^2 + 10x - 48$?

I. $x - 6$
II. $3x - 8$

A. Neither I nor II
B. I only
C. I and II
D. II only

---

21) Zuri has a goal to run at least 12 miles per week while training for a race. This week, she has run 8 miles. If ***x*** represents the additional number of miles Zuri needs to run this week to meet her goal, which inequality represents this situation?

A. $8+x > 12$
B. $8+x < 12$
C. $8-x < 12$
D. $8-x \geq 12$

---

22) In the xy-plane, the graph of $y = 6x$ intersects the graph of $y = x^2 - 55$ at two points. What is the sum of the x-coordinates of the two points of intersection?

A. –5
B. –55
C. 11
D. 6

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