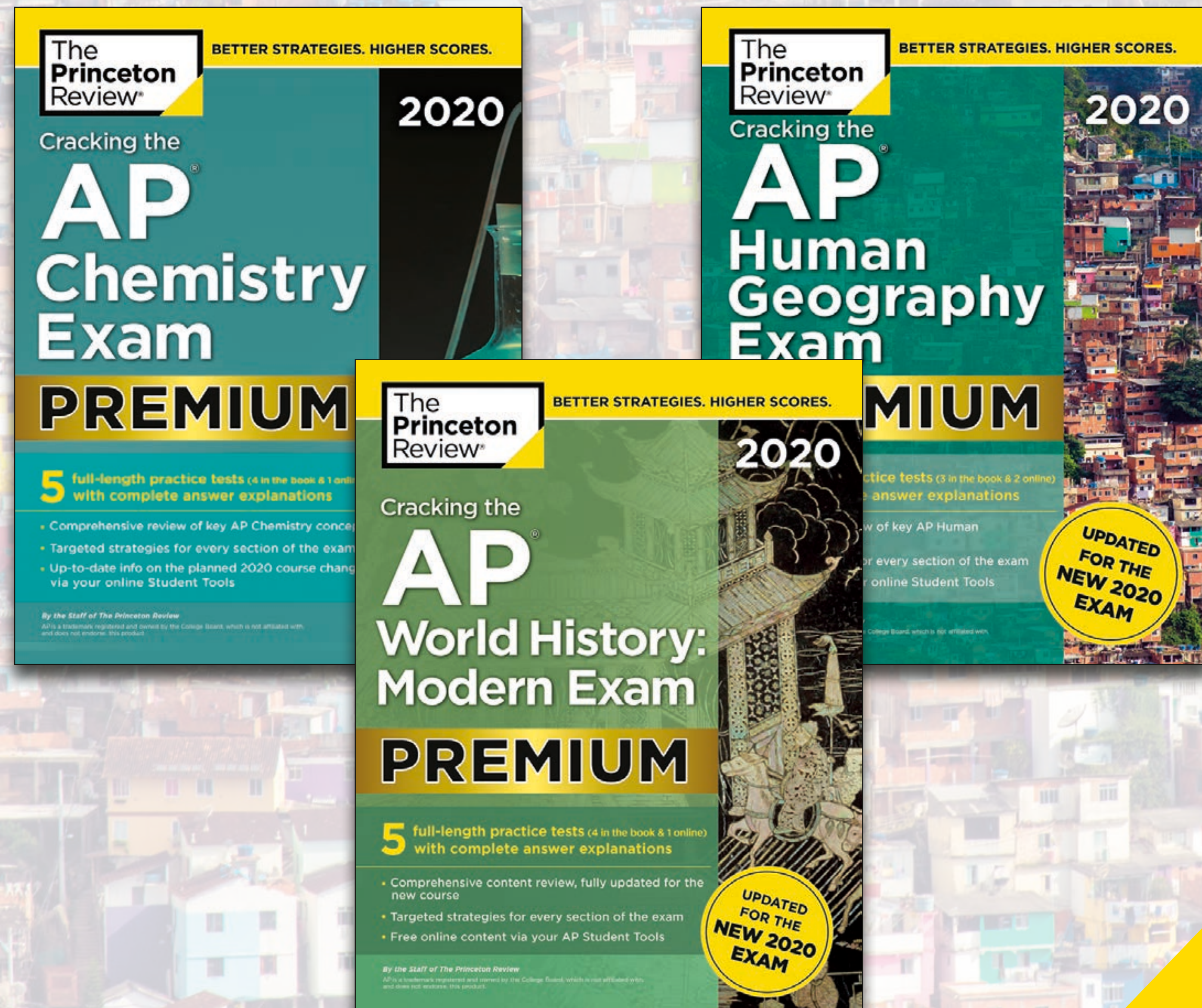
Acing Your AP Exams!

While no one expected AP season to look this way, The Princeton Review is here to help you ace it!



Downloadable Test Prep Guide

AP Exam Updates

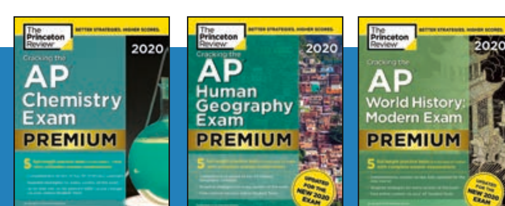
What You Need to Know About the AP Exams

Unlike other tests, the AP exams are still scheduled for May but with some very significant changes. This packet contains sample questions and answers to help you succeed.

Here is what you need to know to about the recent changes to the AP exams::

1. **AP exams will be administered at home.**
   If you are taking the AP exams this May, you'll be doing so from the comfort of your own home. Traditional in-person exams will not take place.
2. **The exams will be shorter and feature a common format.**
   For this year only, the exams will be 45 minutes in duration. They will consist of free-response questions, with no multiple-choice questions.
3. **The exams will only cover what you've studied so far.**
   In the interest of fairness, the exams will include only the topics and skills that you're likely to have covered by early March.
4. **You'll have options for how you take your AP exams.**
   You will be able to take AP exams on any device you have access to—a computer, a tablet, or a smartphone. You'll also have the option to take a photo of your handwritten work. For students without computers or Internet access, the College Board is working to ensure that you'll have the tools and connectivity you'll need to review AP content and take your AP exams.
5. **You'll have options for when you take your AP exams.**
   For each AP subject, there will be two different testing dates. If you're ready to take your exams sooner, you can choose an earlier date. If you need more time to study, you can choose a later date.
6. **Colleges are poised to accept AP exams for credit.**
   The College Board has said that colleges "are committed to ensuring that AP students receive the credit they have worked this year to earn."
7. **The College Board is taking steps to ensure test security.**
   The College Board is designing and planning to administer the questions in ways that prevent cheating. They're also using a range of digital security tools, including plagiarism detection software, to safeguard the integrity of the exams.

Visit GetUnderlined.com to tap into more stellar resources from The Princeton Review and to browse premium test prep books to help you conquer studying at home and getting a perfect 5 on that AP exam!

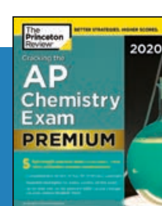


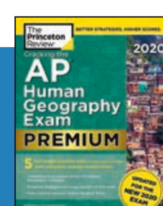
AP Exam Schedule

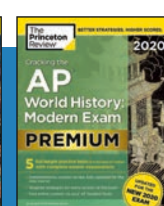
(Subject to Change)

Exam Start Times: Local times may vary depending on a student's geographic location.	Hawaii Time: 6:00 a.m. Alaska Time: 8:00 a.m. Pacific Time: 9:00 a.m. Mountain Time: 10:00 a.m. Central Time: 11:00 a.m. Eastern Time: 12:00 p.m. Greenwich Mean Time: 4:00 p.m.	Hawaii Time: 8:00 a.m. Alaska Time: 10:00 a.m. Pacific Time: 11:00 a.m. Mountain Time: 12:00 p.m. Central Time: 1:00 p.m. Eastern Time: 2:00 p.m. Greenwich Mean Time: 6:00 p.m.	Hawaii Time: 10:00 a.m. Alaska Time: 12:00 p.m. Pacific Time: 1:00 p.m. Mountain Time: 2:00 p.m. Central Time: 3:00 p.m. Eastern Time: 4:00 p.m. Greenwich Mean Time: 8:00 p.m.
Mon, May 11	Physics C: Mechanics	Physics C: Electricity and Magnetism	United States Government and Politics
Tues, May 12	Latin	Calculus AB	Human Geography
Wed, May 13	Physics 2: Algebra-Based	Calculus BC	European History
Thurs, May 14	Spanish Literature and Culture	English Literature and Composition	Physics 1: Algebra-Based
Fri, May 15	Art History	Chemistry	Computer Science A
Mon, May 18	Chinese Language and Culture	United States History	Environmental Science
Tues, May 19	Music Theory	Biology	Japanese Language and Culture Italian Language and Culture
Wed, May 20	German Language and Culture	Psychology	Microeconomics
Thurs, May 21	French Language and Culture	English Language and Composition	Macroeconomics
Fri, May 22	Comparative Government and Politics	World History: Modern Statistics	Spanish Language and Culture

Schedule Credit: College Board





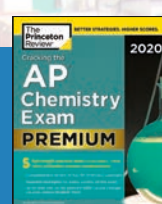


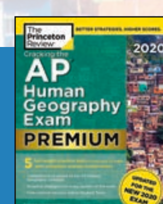
AP Practice Test Questions & Explanations

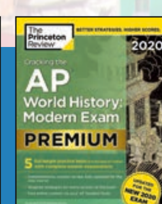
Free response questions (FRQs) on the AP exams vary by subject, but we've selected sample questions from 8 of the most popular tests. Use these questions to help you study. Check your answers.

The Princeton Review®

All sample questions selected from The Princeton Review's Cracking the AP Exam series.







AP Biology Free-Response Question

1. T-cells are a type of cell that is part of our adaptive immune response. T-cells are so named because of their development in the thymus. T-cells come in two distinct types, although there are many other subsets within these two categories.

   Cytotoxic T-cells patrol the body and investigate things presented by a special complex called MHC-I. MHC-I molecules are on each of our cells and present things found within the cell to the cytotoxic T-cells for inspection. If the T-cells detect a problem inside one of our cells, it is destroyed either via cell perforation or via triggered apoptosis. Cytotoxic T-cells are also called CD8+ T-cells because they have the cell surface marker CD8 on their surface. CD8+ T-cells are important for identifying problems inside our cells, such as cancer or a hidden invader such as a virus or an intracellular bacterium.

   CD4+ T-cells are different because they inspect things presented by MHC-II molecules that are found on other immune cells, like B-cells. B-cells inspect extracellular things in the body such as bacteria or viruses that are not inside a cell. B-cells then present any possible foreign antigens to the CD4+ cells, which are also called helper T-cells. If the CD4+ cells confirm that the B-cells have found something dangerous, then they work together to mount an attack.

   Numbers of T-cells can increase if a patient's immune system is challenged. They can also decrease if a patient's immune system is compromised. A researcher was interested in how the levels of T-cells changes over time. For an initial experiment, two participants had blood drawn once a month for an entire year. Patient 1 was diagnosed with an HIV viral infection shortly before being recruited to the study. Patient 2 was self-described as "generally healthy." Each participant's blood was checked for levels of CD8+ and CD4+ T-cells, and the results are given in the figures below.

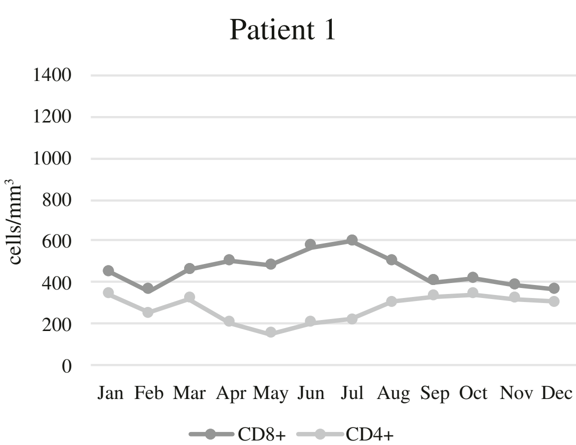


Figure 1. CD4+ and CD8+ T-cell counts for Patient 1

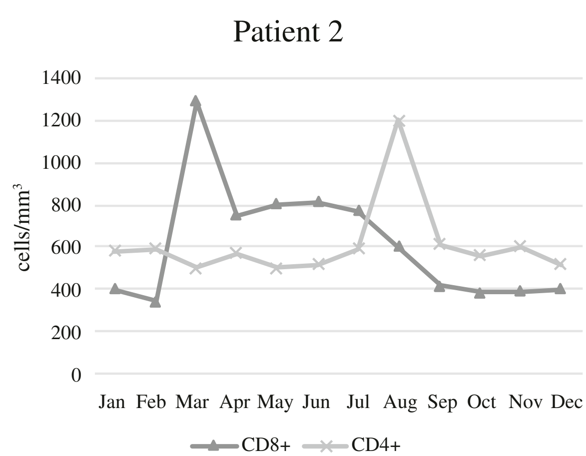
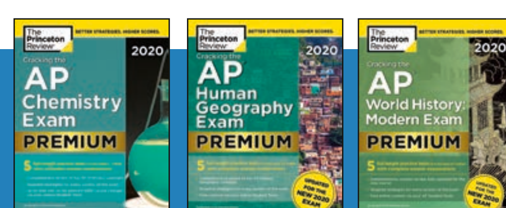


Figure 2. CD4+ and CD8+ T-cell counts for Patient 2



(a) CD8+ T-cells assist in identifying cancer cells. **Explain** the underlying cause of cancer and the role of apoptosis in preventing tumor formation.

(b) **Identify** a weakness in the design of this experiment. **Explain** what could be done to improve the validity of the results if the researcher was designing a follow-up experiment.

(c) **Explain** what the two peaks on the graph represent for Patient 2 and what occurred in the patient's life that may have caused the peaks.

(d) **Describe** how the T-cell counts in Patient 1 are likely affected by an HIV infection, and **predict** how they might change after successful treatment with a new HIV antiviral medication.

AP Biology Explanation

1.

a. CD8+ T-cells assist in identifying cancer cells. **Explain** the underlying cause of cancer and the role of apoptosis in preventing tumor formation. (2 points)

CD8+ T-cells identify cells with internal problems, such as cancer cells that divide uncontrollably. A cancer cell has important genes/proteins for cell cycle control, but those genes/proteins have been damaged. The cell divides when it shouldn't. Apoptosis is programmed cell death. Cells that are damaged and unhealthy get told to self-destruct. T-cells can identify unhealthy cancer cells and tell them to self-destruct. If the self-destruction doesn't work, then the T-cell can try to kill them by perforating the cell.

b. **Identify** a weakness in the design of this experiment. **Explain** what could be done to improve the validity of the results if the researcher was designing a follow-up experiment. (3 points)

A weakness in the experiment is that there is only one participant in each group and it was not repeated. This means there is not any statistical evidence. A better experiment would be to have more participants. It would also be better if the experiment went longer than 1 year. Perhaps there were things that occurred in one year but did not occur in the next year.

c. **Explain** what the two peaks on the graph represent for Patient 2 and what occurred in the patient's life that may have caused the peaks. (3 points)

The left peak for Patient 2 is an increase in CD8+ T-cells in March. This was likely due to the immune system fighting a problem that is inside the cell like a virus or intracellular bacterium or cancer. The right peak is an increase in the CD4+ T-cells in August. This is likely because the patient had an infection of something extracellular and the helper T-cells were needed by another immune cell, like a B-cell.

d. **Describe** how the T-cell counts in Patient 1 are likely affected by an HIV infection, and **predict** how they might change after successful treatment with a new HIV antiviral medication. (2 points)

The CD4+ T-cells are decreased in the patient with an HIV infection. The CD8+ cells seem to be unaffected. If Patient 1 were successfully treated, I predict that the CD4+ T-cell values would increase, perhaps similarly to those values shown in Patient 2.

AP Calculus AB Free-Response Question

1. Let a curve be defined as $x^2 + 4xy + y^2 = 13$.
   (a) Find the equation of the line tangent to the curve at the point (2, 1).
   (b) Find the equation of the line normal to the curve at the point (1, 2).
   (c) Find $\frac{d^2y}{dx^2}$ at (2, 1).

AP Calculus AB Explanation

1. Let a curve be defined as $x^2 + 4xy + y^2 = 13$.

(a) Find the equation of the line tangent to the curve at the point (2, 1).

Take the derivative implicitly with respect to x.

$$x^2 + 4xy + y^2 = 13$$
$$2x + 4(y + xy') + 2y(y') = 0$$

Do not simplify! Plug the coordinate in immediately to find the slope.

$$2(2) + 4[(1) + (2)y'] + 2(1)y' = 0$$
$$4 + 4 + 8y' + 2y' = 0$$
$$10y' = -8$$
$$y' = -\frac{4}{5}$$

Use the point-slope formula to find the equation of the tangent line.

$$y - y_1 = m(x - x_1)$$
$$y - 1 = -\frac{4}{5}(x - 2)$$
$$5y - 5 = -4x + 8$$
$$4x + 5y = 13$$

(b) Find the equation of the line normal to the curve at the point (1, 2).

Use the derivative found in part (a) and plug the coordinate into it to find the slope. Since that would be the tangent slope, the normal slope would be the negative reciprocal.

$$2(1) + 4[(2) + (1)y'] + 2(2)y' = 0$$
$$2 + 8 + 4y' + 4y' = 0$$
$$8y' = -10$$
$$y' = -\frac{5}{4}$$

So, the normal slope is $\frac{4}{5}$.

Use the point-slope formula to find the equation of the normal line.

$$
\begin{aligned}
&y - y_1 = m(x - x_1) \\
&y - 2 = \frac{4}{5}(x - 1) \\
&5y - 10 = 4x - 4 \\
&-6 = 4x - 5y
\end{aligned}
$$

(c) Find $\frac{d^2y}{dx^2}$ at (2, 1).

Recall that you've found the derivative already so now you need to solve for y'.

$$
\begin{aligned}
&x^2 + 4xy + y^2 = 13 \\
&2x + 4(y + xy') + 2y\,y' = 0 \\
&2x + 4y + 4xy' + 2y\,y' = 0 \\
&(4x + 2y)\,y' = -(2x + 4y) \\
&y' = \frac{-(2x + 4y)}{4x + 2y}
\end{aligned}
$$

Take the second derivative implicitly with respect to x using the Quotient Rule for derivatives.

$$y'' = \frac{-(2 + 4y')(4x + 2y) - [-(2x + 4y)(4 + 2y')]}{\left(4x + 2y\right)^2}$$

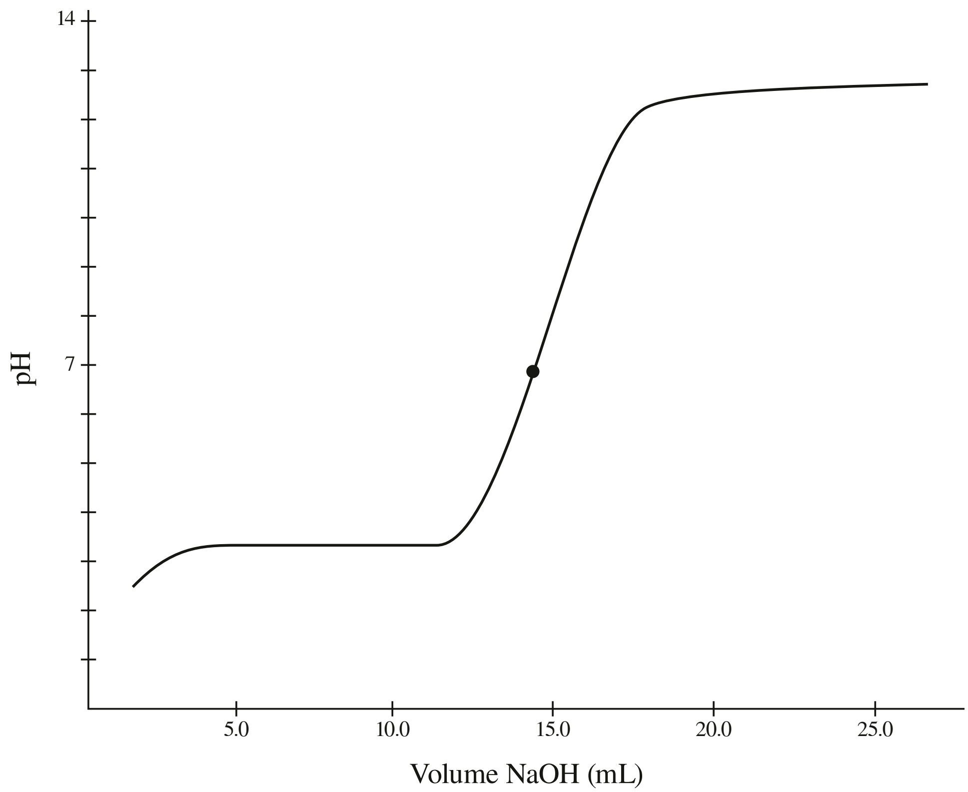
Do not simplify! Plug in the coordinate immediately. Now, in part (a), you figured out the value of y' at (2, 1), which is $-\frac{4}{5}$, which must be plugged in as well.

$$
\begin{aligned}
y'' &= \frac{-\left(2 + 4\left(-\frac{4}{5}\right)\right)(4(2) + 2(1)) + (2(2) + 4(1))\left(4 + 2\left(-\frac{4}{5}\right)\right)}{\left(4(2) + 2(1)\right)^2} \\
&= \frac{\left(-\frac{6}{5}\right)(10) + (8)\left(\frac{12}{5}\right)}{100} \\
&= \frac{156}{500} = \frac{39}{125}
\end{aligned}
$$

AP Chemistry Free-Response Question

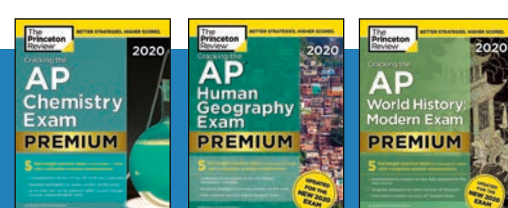
1. $$HA\ (aq) + OH^- \rightarrow A^-\ (aq) + H_2O\ (l)$$

An experiment is performed to determine the molar mass of an unknown weak acid, symbolized by HA. A 0.50 g sample of HA is transferred to a 250 mL flask, dissolved in 100. mL of water, and then titrated with 0.75 *M* NaOH. The pH of the acid solution is measured during the titration, producing the below graph. The first 2.0 mL of the graph are deliberately omitted.



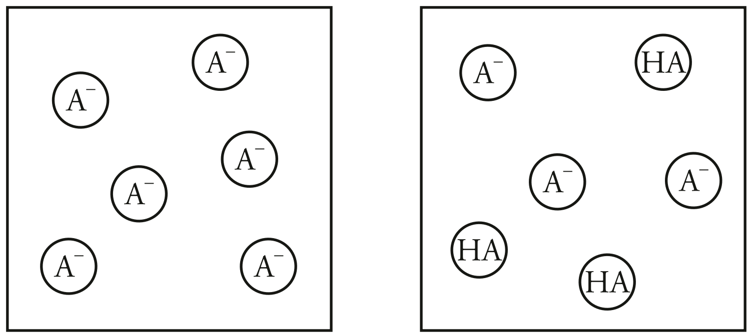
(a) (i) How many moles of acid are present in the sample?
(ii) What is the molar mass of the weak acid?

(b) (i) What is the pK_a of the weak acid?
(ii) Calculate the initial pH of the weak acid.



(c) If some of the acid sample was spilled between the balance and the flask, would that cause the calculated molar mass to be too high, too low, or unchanged? Justify your answer.

(d) Below are two particulate diagrams of the solution in the flask at various points in the titration. The water molecules are omitted in each. For each diagram, identify how many milliliters of NaOH needed to be added to represent the relative concentration of the various species as shown.



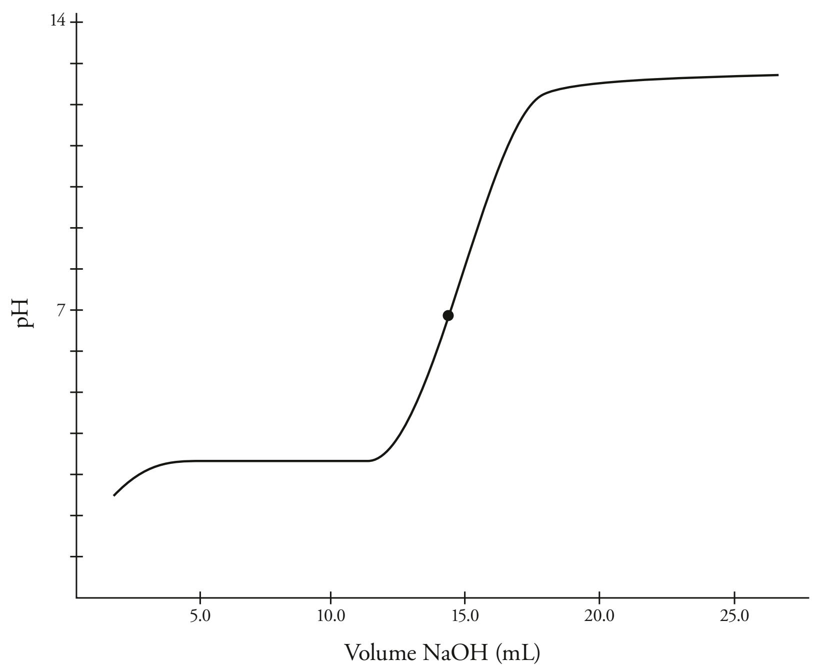
(i) (ii)

(e) Write out the supporting reaction which causes the pH to be basic at the equivalence point of this titration.

AP Chemistry Explanation

$$HA\ (aq) + OH^- \rightarrow A^-\ (aq) + H_2O\ (l)$$

1. An experiment is performed to determine the molar mass of an unknown weak acid, symbolized by HA. A 0.50 g same of HA is transferred to a 250 mL flask, dissolved in 100. mL of water, and then titrated with 0.75 *M* NaOH. The pH of the acid solution is measured during the titration, producing the below graph. The first 2.0 mL of the graph are deliberately omitted.



(a) (i) How many moles of acid are present in the sample?

At equivalence, the moles of acid is equal to the moles of base. The equivalence point of this graph is at about 14.5 mL.

$0.75\ M = \dfrac{n}{0.0145\ \text{L}}$ n = 0.011 mol base at equivalence = 0.011 mol acid

(ii) What is the molar mass of the weak acid?

Molar mass is calculated by dividing the mass of a sample by the number of moles.

$\dfrac{0.50\ \text{g}}{0.011\ \text{mol}} = 45\ \text{g/mol}$

(b) (i) What is the pK_a of the weak acid?

For a weak acid/strong base titration, the pH of the solution at the half-equivalence point is equal to the pK_a of the acid. The equivalence point is at 14.5 mL, and halfway to that is 7.3 mL. At 7.3 mL of base added, the pH of the solution is about 3.3, so that is the p*K*a of the acid.

(ii) Calculate the initial pH of the weak acid.

At the beginning of the titration, the pH of the solution is entirely based on the weak acid. To calculate the pH, both the concentration of the acid and its K_a are necessary. In part (a), it was determined there was 0.011 mol of acid, and if that is divided by the volume in liters that yields the acid's concentration. In part (b)(i), the pKa of the acid is given, and the K_a can be calculated from that.

$$[HA] = \frac{0.011 \text{ mol acid}}{0.100 \text{ L}} = 0.11\ M \qquad pKa = 3.4 \qquad K_a = 4.0 \times 10^{-4}$$

From there, use the expression for a weak acid's K_a to calculate the starting pH. Remember, every time an HA acid molecule dissociates it creates one H^+ and one A^- ion, so the concentration of those will both be equal and can be represented by *x*.

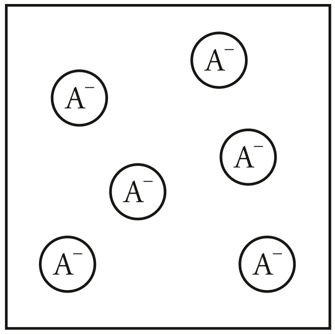
$$K_a = \frac{[H^+][A^-]}{[HA]} \qquad K_a = \frac{x^2}{[HA]}$$

$$4.0 \times 10^{-4} = \frac{x^2}{0.11\ M} \qquad x = [H^+] = 6.6 \times 10^{-3}\ M \qquad pH = -\log(6.6 \times 10^{-3}) = 2.18$$

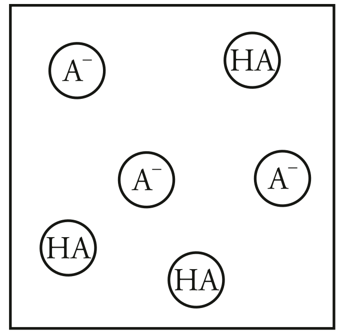
(c) If some of the acid sample was spilled between the balance and the flask, would that cause the calculated molar mass to be too high, too low, or unchanged? Justify your answer.

If some of the acid spilled, the mass of the acid sample used in the calculations would be artificially high. This, in turn, would lead to an artificially high molar mass, as to calculate the molar mass that sample mass is divided by the number of moles of acid (which would be lower, since not all the acid made it into the flask to be titrated).

(d) Below are two particulate diagrams of the solution in the flask at various points in the titration. The water molecules are omitted in each. For each diagram, identify how much NaOH needed to be added to represent the relative concentration of the various species as shown.



(i)



(ii)

(i) This diagram represents the point at which all of the HA molecules have been converted to A^-. As there are no excess OH^- ions present as well, this means the equivalence point has been reached, but not passed. The necessary volume to reach this point is about 14.5 mL.

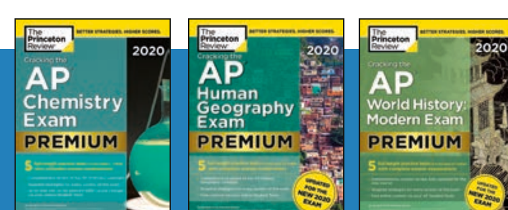
(ii) This diagram represents a point at which only half of the HA molecules have been converted to A^-. That would occur halfway to the equivalence point (where all HA molecules are converted), which is a volume of about 7.3 mL.

(e) Write out the supporting reaction which causes the pH to be basic at the equivalence point of this titration.

The only ion present in significant amounts at equivalence is the conjugate base, A^-. It would react with the water molecules to create some hydroxide ions, making the solution basic.

$A^-\ (aq) + H_2O\ (l) \rightleftharpoons HA\ (aq) + OH^-\ (aq)$

$$2NO\ (g) + O_2\ (g) \rightarrow 2NO_2\ (g)$$



AP English Language and Composition Free-Response Question

1. From international agencies and global corporations to small, local nonprofit groups, organizations have formed as a way to get things done when individuals couldn't. How these organizations are governed plays a major role in their success at achieving their goals.

   Carefully read the following seven sources, including the introductory information for each source. Then synthesize information from at least three of the sources and incorporate it into a coherent, well-written essay that addresses this question: What main factor(s) contribute(s) to the good governance of an organization?

   Use the sources to develop and explain your argument. Avoid merely summarizing the sources. Indicate clearly which sources you are drawing from, whether through direct quotes, paraphrase, or summary. You may cite the sources as Source A, Source B and so forth, or by using the descriptions in parentheses.

   Source A (TI Malaysia)
   Source B (IMF)
   Source C (Laubscher)
   Source D (UNESCAP)
   Source E (Homeland Security)
   Source F (OECD)
   Source G (World Bank)
   Source H (Hodgson)

Source A

"1MDB—Mismanagement or Misappropriation?
The Jury Is Still Out!" 11 April 2016.

The following is excerpted from a press release issued by The Malaysian Society for Transparency and Integrity (TI Malaysia).

There is simply no support for the view that the First Amendment, as originally understood, would permit the suppression of political speech by media corporations. The Framers may not have anticipated modern business and media corporations….Yet television networks and major newspapers owned by media corporations have become the most important means of mass communication in modern times.

The First Amendment was certainly not understood to condone the suppression of political speech in society's most salient media. It was understood as a response to the repression of speech and the press that had existed in England and the heavy taxes on the press that were imposed in the colonies. The great debates between the Federalists and the Anti-Federalists over our founding document were published and expressed in the most important means of mass communication of that era—newspapers owned by individuals. At the founding, speech was open, comprehensive, and vital to society's definition of itself; there were no limits on the sources of speech and knowledge. The Framers may have been unaware of certain types of speakers or forms of communication, but that does not mean that those speakers and media are entitled to less First Amendment protection than those types of speakers and media that provided the means of communicating political ideas when the Bill of Rights was adopted.

Modern day movies, television comedies, or skits on Youtube.com might portray public officials or public policies in unflattering ways. Yet if a covered transmission during the blackout period creates the background for candidate endorsement or opposition, a felony occurs solely because a corporation, other than an exempt media corporation, has made the "purchase, payment, distribution, loan, advance, deposit, or gift of money or anything of value" in order to engage in political speech. Speech would be suppressed in the realm where its necessity is most evident: in the public dialogue preceding a real election. Governments are often hostile to speech, but under our law and our tradition it seems stranger than fiction for our Government to make this political speech a crime.

Source B

Kaufman, Daniel, "Back to Basics—10 Myths About Governance and Corruption," September 2005.

The following is excerpted from an article in the September 2005 issue of Finance & Development, *a quarterly publication of the International Monetary Fund.*

Governance—which remains a sensitive and misunderstood topic—is now being given a higher priority in development circles. A few donors and international financial institutions (IFIs) have begun to work with some emerging economies to help reduce corruption, and encourage citizen voice, gender equality, and accountability. … And in May, the joint report by the Africa Commission explicitly stated: "Good governance is the key... Unless there are improvements in capacity, accountability, and reducing corruption... other reforms will have only limited impact." …

Let us therefore go back to basics and address some prevailing "myths" about governance and corruption. …

Myth #3: The importance of governance and anti-corruption is overrated. … The research generally shows that countries can derive a very large "development dividend" from better governance. We estimate that a country that improves its governance from a relatively low level to an average level could almost triple the income per capita of its population in the long term, and similarly reduce infant mortality and illiteracy. …

Governance also matters for a country's competitiveness and for income distribution. In the case of corruption, research suggests it is equivalent to a major tax on foreign investors. … A rough estimate of the extent of annual worldwide transactions that are tainted by corruption puts it close to $1 trillion.

To make matters worse, aid-funded projects tend to fail in corrupt settings. And corruption undermines fledgling democracies. Of course, governance is not the only thing that matters for development. … But when governance is poor, policymaking in other areas is also compromised.

Myth #4: Governance is a luxury that only rich countries can afford. Some claim that the link between governance and incomes does not mean that better governance boosts incomes, but the reverse—higher incomes automatically translate into better governance. However, our research does not support this claim. It is thus misleading to suggest that corruption is due to low incomes, and invent a rationale for discounting bad governance in poor countries….

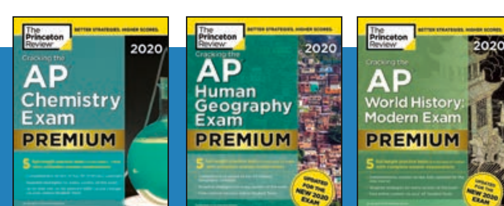
Myth #5: It takes generations for governance to improve. While it is true that institutions often change only gradually, in some countries there has been a sharp improvement in the short term. This defies the view that while governance may deteriorate quickly, improvements are always slow and incremental. …

Myth #6: Donors can "ringfence" projects in highly corrupt countries and sectors. With the possible exception of some humanitarian aid projects, the notion that the aid community can insulate projects from an overall corrupt environment in a country is not borne out by the evidence. The data suggest that when a systemic approach to governance, civil liberties, rule of law, and control of corruption is absent, the likelihood of an aid-funded project being successful is greatly reduced.

Myth #7: Fight corruption by fighting corruption. A fallacy promoted by some in the field of anticorruption, and at times also by the international community, is that one "fights corruption by fighting corruption"—through yet another anticorruption campaign, the creation of more "commissions" and ethics agencies, and the incessant drafting of new laws, decrees, and codes of conduct. Overall, such initiatives appear to have little impact, and are often politically expedient ways of reacting to pressures to do something about corruption, substituting for the need for fundamental and systemic governance reforms. …

* * * * *

The challenge of governance and anticorruption confronting the world today strongly argues against the "business-as-usual" modus operandi. A bolder approach is needed, and collective responsibility at the global level is called for. The rich world must not only deliver on its aid and trade liberalization promises, it must also lead by example…. Finally, countries themselves must take the lead in improving governance.



Source C

Laubscher, Hendrik, “What Jack Ma Taught Us About Good Corporate Governance This Week,” Sep 10, 2018.

The following is abridged from an online article in the Retail section of forbes.com.

Earlier today (Monday), Jack Ma did some more teaching. Teacher Ma as he is affectionately known inside Alibaba provided a blueprint for succession and corporate governance. Ma wrote to his customers, his Alibaba colleagues and Alibaba shareholders to inform them of his handing over the chairperson role of Alibaba to CEO, Daniel Zhang in one year’s time. What is very important to note here is that Ma has not picked a family member to succeed him, but picked Daniel Zhang based on merit and business acumen. Asian business has a history of using hereditary succession but Alibaba has shown the direction for global businesses to take. It ensures that the growth of staff and business can continue, as these individuals are essentially leveraging their experience and training to continue generating profits for business.

Alibaba will be just fine moving forward

If you have read the press in the last 4 days it would seem that Alibaba is going to experience staff movements, and experience turbulence due to Jack Ma stepping down as Executive Chairman in one year’s time. Early investors like GGV Capital believe that everything will be fine. I tend to agree.

The truth is that Alibaba has created a corporate structure that ensures succession planning was done in a transparent manner over the last 10 years. Alibaba has two very important governance structures that ensure that roles are clearly defined and that visibility into all business areas is provided to management. Its Senior Management team is headed by CEO Daniel Zhang. Zhang, Joe Tsai and Maggie Wu are the three leaders who are the voices behind Alibaba’s quarterly earnings calls. Essentially this Senior Management team is responsible for the day-to-day operations of Alibaba. Notice that I did not mention Jack Ma. Ma has not been actively part of the day-to-day operations for five years so investors have to a degree experienced Alibaba without Ma being at the helm. In Ma’s letter, he mentions that Zhang has led Alibaba in a period that contained consistent and sustainable growth for 13 consecutive quarters. …

The Alibaba Partnership

The most powerful thing that will drive Alibaba for generations is the Alibaba Partnership. … First, a few important points to keep in mind regarding the Partnership. It was designed, to ensure the mission, culture and values of Alibaba survive well beyond any individual. …As Jack Ma is a lifelong member of the Alibaba Partnership, he will continue to play an important role in creating policies and future plans for the company with the other partners. …

This group is the talent pool for Alibaba leadership and contains an above average amount of senior female leaders.

The Partnership plays an important role in succession for CEO and Chairman because of its role on the board. The Partnership has the right to nominate (but not elect) a simple majority of members to Alibaba Group’s Board of Directors. This means when it comes time to choose a new Executive Chairman, the Partnership-nominated directors have intimate knowledge of that executive’s leadership style, operation abilities and character. This is in contrast to the way most public companies handle succession. There is a talent search which often does not emphasize culture and values….

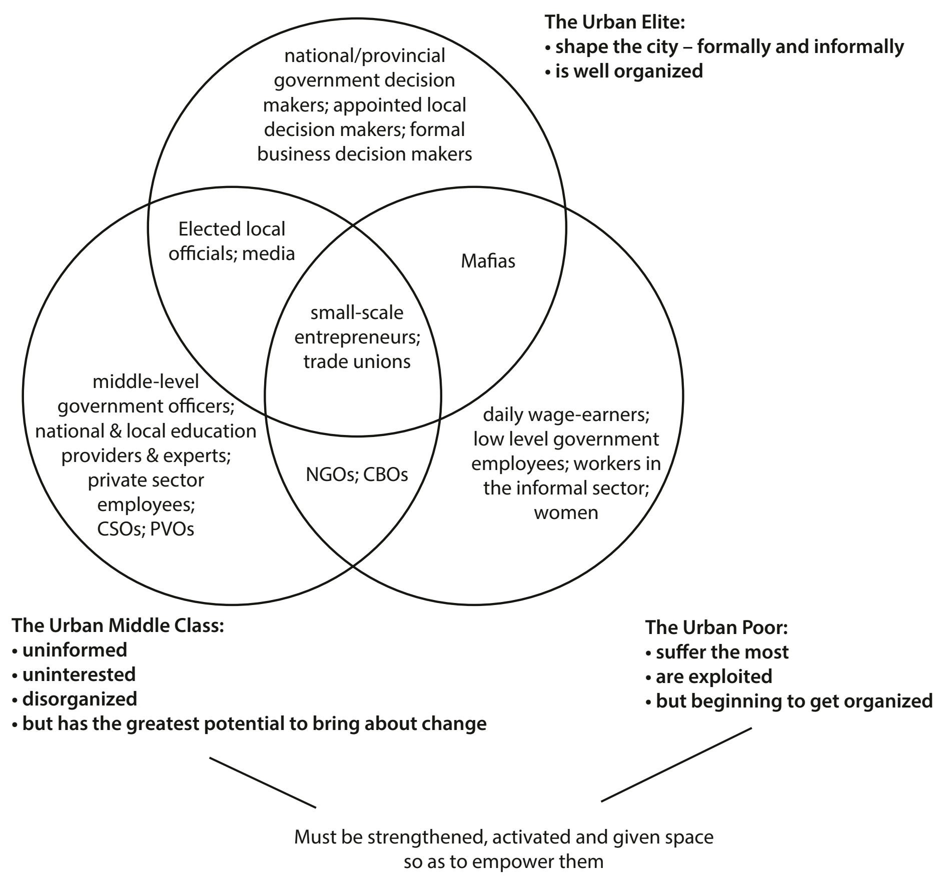
Alibaba is a leader in terms of governance and its succession planning

There is this perception that Chinese businesses are followers but in the case of governance and succession planning, it is clearly showing us the future. Can you name who the successors are at Amazon, JD.com or eBay in case something happens to Jeff Bezos, Richard Liu or Devin Wenig? …

Source D

“What is Good Governance?”, UNESCAP, July 2009.

The following diagram is taken from What is Good Governance?*, an article released by United Nations Economic and Social Commission for Asia and the Pacific, July 2009.*



Source E

"Cybersecurity Governance in the State of Michigan: A Case Study," December 2017.

The following excerpts are taken from State Cybersecurity Governance Case Studies*, a report by the U.S. Department of Homeland Security and the National Association of State Chief Information Officers (NASCIO).*

The Overall Challenge:

How to address a range of cybersecurity challenges that cut across multiple government, public, and private sector organizations?

Overall Lessons Learned from Michigan's Governance Approach:

- Leadership Matters. Leaders across multiple government, public, and private organizations make cybersecurity, and cybersecurity governance, a priority.
- Leadership Is Not Everything. Laws, policies, structures, and processes instantiate and align cybersecurity governance with cybersecurity priorities so that focus does not change as personalities change.
- Governance Crosses Organizational Boundaries. The distributed nature of cybersecurity requires a range of governance mechanisms that connect across multiple organizations and sectors. …

Since the early 2000s, the state of Michigan executive and legislative branches have taken a series of deliberate steps to enable cybersecurity to be governed as an enterprise-wide strategic issue both across state government and across a diverse set of public and private sector stakeholders. …

The state of Michigan government governs information technology (IT) through a centralized structure, which enables a unified and coordinated approach to cybersecurity across the executive branch. …

Michigan also utilizes a range of governance structures and processes to address a variety of cybersecurity challenges that require collaboration and coordination across public and private stakeholders. For example, Michigan has established a cross-ecosystem governance approach to managing cyber incident response. Working collaboratively with federal, state, local, and private sector organizations, leaders from the Cyber Security Infrastructure Protection Division of the [Department of Technology Management and Budget] DTMB and the Emergency Management and Homeland Security Division of the Michigan State Police developed the Cyber Disruption Response Plan (CDRP). The CDRP provides a framework for emergency management and IT agencies to identify cyber threats and coordinate cyber response and recovery operations. The plan uses a threat matrix that considers cyber events along a five-level escalation/de-escalation path and articulates which organization is responsible for the cyber response management at each level. Stakeholders across the ecosystem rely on consistent, informal communications, in combination with formal communication lines, to stay prepared for cyber disruptions. …

Information sharing has also played a critical role in connecting a cybersecurity ecosystem of public and private sector stakeholders. … "Over time, relationships and trust were built with partners across government, private, academia, etc. to a point where communication and partnership are part of the fabric of how [the state of Michigan approaches cybersecurity]," Ashley Gelisse, the Chief of Staff to the [Chief Information Officer] CIO, said. …

Cybersecurity is a challenge that cuts across many issues and many interdependent stakeholders. Therefore, Michigan uses a range of governance mechanisms to work across different public, private, academic and nonprofit organizations. … Governor Rick Snyder made cybersecurity a top priority. He and others in the executive branch agencies, state legislature, and private organizations addressed cybersecurity as important from both a threat mitigation and economic development perspective. However, leadership was not everything. Protecting data and critical infrastructure across the state, not just in state-run systems, required engagement and partnership across the entire cybersecurity ecosystem. In Michigan, tangible laws, policies, structures, and processes instantiated and aligned cybersecurity governance with broader cybersecurity priorities.

Source F

"Trust in government, policy effectiveness and the governance agenda," Government at a Glance 2013.

The following excerpts are taken from Government at a Glance 2013, a publication of the Organisation for Economic Cooperation and Development (OECD).

The financial and economic crisis that started in 2008 led to a significant loss of trust in government. By 2012, on average only four out of ten people in OECD member countries expressed confidence in their government. As governments search for a path to economic recovery, the challenge they face is not only knowing what policies to choose, but also how to implement those policies. Yet, capacity to implement depends crucially on trust. Without trust in governments, markets and institutions, support for necessary reforms is difficult to mobilise, particularly where short-term sacrifices are involved and long-term gains might be less tangible. The sharp decline in trust in government is serving to underline that trust is an essential, yet often overlooked, ingredient in successful policy making. …

Trust in government seems to be especially critical in crisis situations, such as natural disasters, economic crisis or political unrest which focuses attention on the core functions of public governance. The capacity of governments to manage crises and to implement successful exit strategies is often a condition for their survival and for their re-election. In the aftermath of major disasters, lack of trust may hamper emergency and recovery procedures causing great harm to society and damaging government's capacity to act. Likewise, the current economic crisis may reveal dimensions of trust that were not evident in the gradual evolution of countries in the years that preceded it. …

A general finding is that trust and most of its drivers are interlinked and self-fulfilling, and therefore complementary in their relationship to public governance and economic development. …

Most important of all, however, a renewed focus on trust in government can bring a new perspective to public governance, enhancing the role of the citizens. At an institutional level, this should reinforce the notion of a social contract between citizens and the state, where the former contribute not only by paying taxes and obeying the law, but also by being receptive to public policies and co-operating in their design and implementation. To gain this support from citizens, however, governments need to be more inclusive, more transparent, more receptive and more efficient. Recognising and better understanding the critical role that trust plays in effective public policies should assist governments better shape their policy and reform agendas, improving outcomes for all.

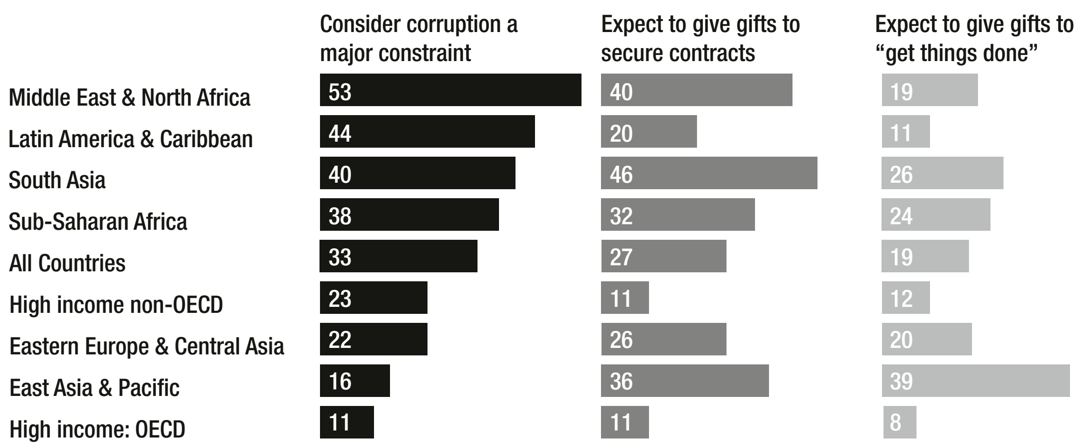
Source G

"Combating Corruption," Tariq Khokhar, May 9, 2016.

The following chart and the text excerpts below it appear in The World Bank DATA Blog, 05/09/2016, and The World Bank Brief, "Combatting Corruption."

1 in 3 Companies Constrained by Corruption

Percentage of companies surveyed about dealing with government that:



AP English Language and Composition Rubric

<table>
<tr><th colspan="6">Synthesis Essay Rubric</th></tr>
<tr><td>Row A</td><td colspan="2">0 points:
• There is no defensible thesis.
• The intended thesis only restates the prompt.
• The intended thesis provides a summary of the issue with no apparent or coherent claim
• There is a thesis, but it does not respond to the prompt</td><td colspan="3">1 point:
• Responds to the prompt with a thesis that presents a defensible position</td></tr>
<tr><td>Row B</td><td>0 points:
• Simply restates thesis (if present), repeats provided information, or references fewer than two of the provided sources</td><td>1 point:
• Provides evidence from at least two of the provided sources
AND
• Summarizes the evidence but does not explain how the evidence supports the student’s argument</td><td>2 points:
• Provides evidence from or references at least three of the provided sources
AND
• Explains how some of the evidence supports the student’s argument, but no line of reasoning is established, or the line or reasoning is faulty</td><td>3 points:
• Provides specific evidence from at least three of the provided sources to support all claims in a line of reasoning
AND
• Explains how the some of the evidence supports a line of reasoning</td><td>4 points:
• Provides specific evidence from at least three of the provided sources to support all claims in a line of reasoning
AND
• Consistently explains how the evidence supports a line of reasoning</td></tr>
<tr><td>Row C</td><td colspan="2">0 points:
• Does not meet the criteria for one point</td><td colspan="3">1 point:
• Demonstrates sophistication of thought and/or a complex understanding of rhetorical sophistication</td></tr>
</table>

AP European History Free-Response Question

1.

Analyze the illustration below and answer all parts of the questions that follow.

"As it ought to be, or … the ladies trying a contemptible scoundrel for a 'breach of promise'"
George Cruikshank, English illustrator, 1849

a) Describe one socioeconomic factor <u>accelerating</u> the women's movement in England at the time of the drawing.
b) Describe one socioeconomic factor <u>restricting</u> the women's movement in England at the time of the drawing.
c) Explain one example of a political success <u>in the early twentieth century</u> enjoyed by the women's movement in England.

AP European History Explanation

Question 1

a) There are many possible answers to this question of what helped feminism. Bigger, more industrialized countries such as England and France did not have such oppressive governments as other countries did, which allowed early feminism to flourish. Another possibility: The expansion of the middle class in these countries brought greater leisure time to that part of the population, which used it to agitate for progressive causes such as feminism. Or the urbanization, media, and transportation that rose up in the cities created a more closely-linked society, which shared news and built social movements much more quickly than rural parts of society could.

b) Feminism was restricted by a system of Victorian principles that made a clear distinction between public and private spheres; men occupied the former while women occupied the latter.

c) The obvious answer here would be the success of the women's suffrage movement, which was headed by the Pankhurst sisters. However, the entrance of women into the workforce during World War I is another possible answer.

AP Human Geography Free-Response Question

1. Globalization has affected nearly every aspect of modern life, and that includes world religions.

    A. List the three major religious belief systems of the world.

    B. Explain the difference between *polytheistic* and *monotheistic* religions.

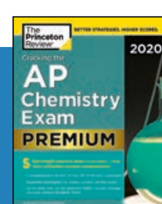
    C. Explain the reason for the historical diffusion of voodoo beliefs.

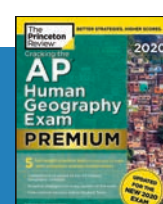
    D. Describe the difference in the view of the afterlife in TWO major world religions.

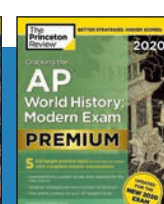
    E. Describe the major denominations of ONE world religion.

    F. Explain ONE *benefit* that globalization brings to a religion.

    G. Explain ONE *challenge* that globalization brings to a religion.







AP Human Geography Explanation

1. World Religions
    A. The three major religious belief systems are
        i. Animism
        ii. Hinduism/Buddhism (and Jainism)
        iii. Abrahamic religions—Judaism, Christianity, Islam

    B. Explain the difference between *polytheistic* and *monotheistic* religions.
        i. Polytheistic religions believe in a multitude of supreme gods. The Hindu-Buddhist tradition contains many examples of polytheistic religions, such as Jainism. They're most common in Asia.
        ii. Monotheistic religions believe in one supreme god. The Abrahamic tradition contains many examples of monotheistic religions, such as Judaism. In addition to the one supreme god, there are lower entities such as angels and saints and minor devils.

    C. Relocation diffusion of voodoo
        i. Voodoo (or voodoun) beliefs originated in West Africa and were brought to the Americas via the European-dominated slave system. Voodoo is principally found in the Caribbean areas that received the most African slaves, including Louisiana, Haiti, Cuba, Belize, and northern Brazil.

    D. The afterlife
        i. Christianity believes in an afterlife that consists of either heaven or hell, depending on one's moral choices during life.
        ii. Islam holds essentially the same beliefs as Christianity, with the added belief that a human soul goes to the Angel of Death to await Judgment Day, when the heaven or hell decision is made.
        iii. Buddhism believes in reincarnation, and that we are reborn into a higher or lower position on this earth depending upon one's *karma*. One can be reborn as an animal, an insect, or a plant.
        iv. Hinduism holds essentially the same beliefs as Buddhism.
        v. Judaism holds very few beliefs about the afterlife.

    E. Denominations
        i. Christianity
            1. Protestant
            2. Roman Catholic
            3. Eastern Orthodox

- ii. Judaism
    1. Orthodox
    2. Conservative
    3. Reconstructionist
    4. Reform
- iii. Islam
    1. Sunni
    2. Shia
- iv. Buddhism
    1. Theravada
    2. Mahayana
    3. Vajrayana
- v. Hinduism
    1. Vaishnavism
    2. Shaivism
    3. Shaktism
    4. Smartism

F. Benefits that globalization brings to a religion

- i. Easy communication with other believers far away
- ii. Enhanced fundraising ability
- iii. Faster dissemination of ideas for proselytizing religions via television, internet, etc.
- iv. Easier transportation that has made religious pilgrimages easier

G. Challenges that globalization brings to a religion

- i. Globalization makes believers more aware of their religion as merely one in a field of competing belief systems, which can cause less belief.
- ii. Greater interaction with other religions causes greater conflict between other religions, which causes defensiveness.
- iii. Ethnic religions, in which believers must be born into the faith, are indifferent or hostile to the hybridization that comes with globalization.

AP Physics 1 Free-Response Question

1. In a physics experiment, a pellet of mass 2 kg is fired from an air gun horizontally toward a block of mass 18 kg attached to a string on the ceiling. When the pellet strikes the block, it becomes embedded and the pellet-block system reaches a maximum height of 0.2 m.

   (a) What is the total energy of the system when the pellet-block system reaches its maximum height?

   (b) What is the speed of the pellet-block system just after the pellet collides into the block?

   (c) What is the initial speed of the pellet?

AP Physics 1 Explanation

1. (a) At its maximum height, the pellet-block system has only potential energy, so the total energy can be calculated to be

$$U = mgh = (m_{\text{pellet}} + m_{\text{block}})gh = (2\text{ kg} + 18\text{ kg}) \cdot 10\text{ m/s}^2 \cdot 0.2\text{ m} = 40\text{ J}$$

(b) After the pellet collides with the block, the pellet-block system has only kinetic energy. This kinetic energy is completely converted to potential energy when the block swings up to a height of 0.2 m. As the block had a total potential energy of 40 J when it swung up to its maximum height, the pellet-block system has a total kinetic energy of 40 J just after the collision. This allows the speed of the pellet-block system just after the collision to be calculated as

$$K = \frac{1}{2}mv^2 \Rightarrow v = \sqrt{\frac{2K}{m}} = \sqrt{\frac{2 \cdot 40\text{ J}}{2\text{ kg} + 18\text{ kg}}} = \sqrt{\frac{80\text{ J}}{20\text{ kg}}} = 2\text{ m/s}$$

(c) As the pellet becomes embedded in the block, the collision between the pellet and block is perfectly inelastic, so the initial speed of the block can be calculated by using Conservation of Momentum:

$$m_{\text{pellet}}v_{\text{pellet}} + m_{\text{block}}v_{\text{block}} = (m_{\text{pellet}} + m_{\text{block}})\, v_{\text{final}}$$

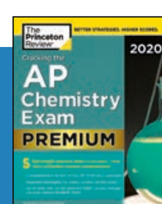
$$2\text{ kg} \cdot v_{\text{pellet}} + 18\text{ kg} \cdot 0\text{ m/s} = (2\text{ kg} + 18\text{ kg}) \cdot 2\text{ m/s}$$

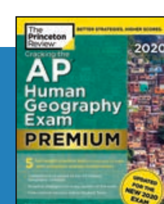
$$2\text{ kg} \cdot v_{\text{pellet}} + 0 = (2\text{ kg} + 18\text{ kg}) \cdot 2\text{ m/s}$$

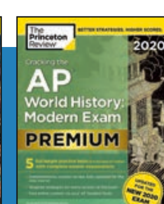
$$2\text{ kg} \cdot v_{\text{pellet}} = 20\text{ kg} \cdot 2\text{ m/s}$$

$$2 \cdot v_{\text{pellet}} = 20 \cdot 2\text{ m/s}$$

$$v_{\text{pellet}} = 20\text{ m/s}$$







AP U.S. Government and Politics Free-Response Question

1. "The effects on the federal budget of the aging population and rapidly growing health care costs are already apparent over the ten-year horizon—especially for Social Security and Medicare—and will grow in size beyond the baseline period. Unless laws governing fiscal policy are changed—that is, spending for large benefit programs is reduced, increases in revenues are implemented, or some combination of those approaches is adopted—debt will rise sharply relative to GDP (Gross Domestic Product) after 2027."

"The Budget and Economic Outlook: 2017 to 2027"—Congressional Budget Office

After reading the scenario, respond to A, B, and C below:

(A) Explain one cause for the trend described in the scenario.

(B) Describe a power Congress or the president could use to reverse the trend outlined in the quote.

(C) Explain how the power you identified in Part B could be affected by linkage institutions.

AP U.S. Government and Politics Free-Response Question

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AP U.S. Government and Politics Explanation

Question 1

(A) Explain one cause for the trend described in the scenario.

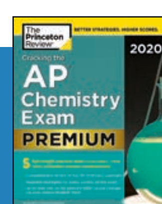
Begin by identifying the trend, which is that spending by Social Security and Health and Human Services has increased dramatically during the past few decades, and, according to the Congressional Budget Office (CBO) report, will continue to increase until 2027.

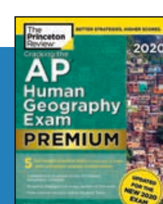
Any one of the following can be used to explain a cause for that trend:

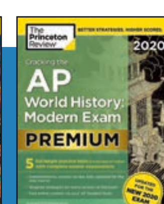
- The senior citizen population has been steadily increasing throughout the past few decades due to better medical care, more active lifestyles in older populations, and a general increase in the U.S. population. Seniors collect Social Security payments for longer periods of time than in generations past. The increased senior population led to higher enrollment in Medicare, which provides government-funded medical insurance for seniors. Since Medicare is a social insurance program funded by the U.S. government, higher enrollment in the program resulted in a rise in its cost and the agency's budget ate up a higher percentage of the national budget. In fact, almost half of the U.S. budget is devoted to mandatory spending such as Social Security, Medicare, and Medicaid.

- Health care costs are rising in the United States. Medicare and Medicaid costs are directly tied to the cost of medicine in private systems. These costs, dictated by market forces, are predicted to continue to climb into the near future.

- Medicaid, a health-benefits program designed to support low-income Americans, was dramatically expanded after the passage of the Affordable Care Act (ACA) in 2010. This has resulted in a larger number of people being enrolled in the program, which ensures the long-term trend from the CBO's report.







(B) Describe a power Congress or the president could use to reverse the trend outlined in the quote.

Remember that the CBO report mentions not only higher costs in the Social Security and Medicare/Medicaid sectors, but also revenue concerns. Possible answers include:

- Raising federal income tax rates and/or limiting federal income tax deductions
- Reducing Social Security and/or Medicare payments to high-income seniors
- Raising the eligibility age for Social Security
- Reducing Medicare eligibility and/or qualified benefits
- Reducing other budget expenditures, such as defense

Also bear in mind that presidents are responsible for submitting budgets to Congress for approval, so these two entities are directly responsible for any imbalances in spending and revenues. They are the sole channel for implementing change in either category. In addition, federal agencies cannot spend money unless funds are authorized by the House and Senate Appropriations Committees. Appropriations bills must then be signed by the president in order to give federal agencies the legal authority to spend.

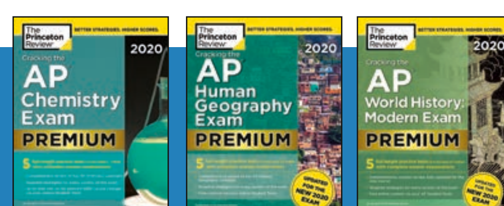
(C) Explain how the power you identified in Part B could be affected by linkage institutions.

"Linkage institutions" are channels that allow individuals to communicate their preferences to policy makers. This can include a variety of groups: political parties, interest groups, and the media. Even elections can serve to "link" the electorate to their representatives.

In general, Democrats and liberals tend to favor generous spending for Social Security and Medicare, although they may favor cutting these benefits for certain high-income citizens. Republicans and Libertarians generally support low taxes and restricted spending. Therefore, linkage institutions will influence Congress and the president in ways that correspond to their ideology. Linkage institutions can influence budgetary issues in the following ways:

- When presidents or members of Congress propose budgetary changes, nonprofit think tanks such as the Center on Budget and Policy Priorities or the Bipartisan Policy Center can evaluate these proposals and provide their endorsement (or criticism).

- Some organizations, such as the American Enterprise Institute, the Center for American Progress, the Economic Policy Institute, The Heritage Foundation, and the Roosevelt Institute Campus Network create their own budget plans and policy proposals to attempt to influence Congress.



- Specific interest groups such as the American Association of Retired People (AARP) lobby Congress to ensure that any changes to Social Security and Medicare align with their members' interests.

- Politicians often campaign by discussing specific issues relevant to Social Security and other entitlement spending. In states with high numbers of senior voters, such as Florida, representatives know that policy decisions must align with their electorate's interests.

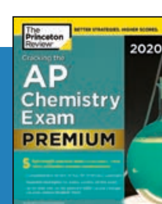
AP U.S. History Free-Response Question

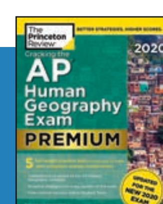
Question 1 is based on the excerpts below.

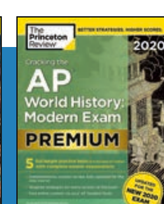
> "Our own direct interests were great, because of the Cuban tobacco and sugar, and especially because of Cuba's relation to the projected Isthmian [Panama] Canal. But even greater were our interests from the standpoint of humanity. ... It was our duty, even more from the standpoint of National honor than from the standpoint of National interest, to stop the devastation and destruction. Because of these considerations I favored war."
>
> President Theodore Roosevelt, *Theodore Roosevelt: An Autobiography,* 1913

> "The Spanish-American War was fomented on outright lies and trumped up accusations against the intended enemy. ... War fever in the general population never reached a critical temperature until the accidental sinking of the USS Maine was deliberately, and falsely, attributed to Spanish villainy. ... In a cryptic message ... Senator Lodge wrote that 'There may be an explosion any day in Cuba which would settle a great many things. We have got a battleship in the harbor of Havana, and our fleet, which overmatches anything the Spanish have, is masked at the Dry Tortugas.'"
>
> Paul Atwood, historian, *War and Empire,* 2010

1. Using the excerpts, answer (a), (b), and (c)
   a) Briefly explain ONE major difference between Roosevelt's and Atwood's historical interpretations of the United States' involvement in the Spanish-American War.
   b) Briefly explain how ONE historical event or development in the relevant time period could be used to support Roosevelt's interpretation.
   c) Briefly explain how ONE historical event or development in the relevant time period could be used to support Atwood's interpretation.







AP U.S. History Explanation

Question 1

The Spanish-American War of 1898 was a hallmark product of President McKinley's expansionist policies. The war's genesis stemmed from a Cuban insurrection against Spain. At first, most Americans wanted to stay out of the conflict (although they supported Cuban independence). But tabloid newspaper accounts of the war, known as "yellow journalism," blatantly falsified stories and photographs of Spanish "atrocities" in Cuba. Such reporting helped turn popular opinion toward intervention. The press' manipulation of public opinion reached a zenith with the sinking of the *U.S.S. Maine*, a U.S. battleship, anchored in Havana Harbor. An explosion onboard left 260 Americans dead, but the cause or responsible agent was never definitely determined. Despite a distinct lack of evidence implicating Spain, the press "tried and convicted" Spain of bombing the *Maine*.

McKinley issued a warning and strict conditions to Spain soon after the event. Spain accepted McKinley's terms but Congress had already moved to mobilize for war, and thus, war began. The war itself was relatively brief. The United States was well-armed and won the war with comparatively few casualties. The modern American Navy, led by Commodore Dewey, and the Rough Riders, a cavalry unit, led by Theodore Roosevelt in the Battle of San Juan Hill, distinguished itself. In the end, Spain surrendered all claims to Cuba, which emerged as an independent nation, and the United States acquired Puerto Rico, Guam, and the Philippines.

a) An effective answer to part (a) will highlight differences between Roosevelt's and Atwood's positions on the Spanish-American war including

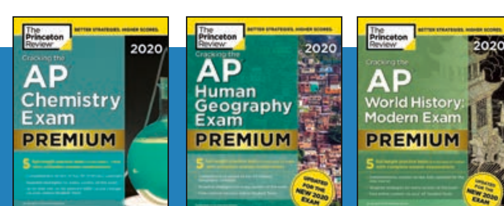
- whether the War was wholly selfish on the part of the United States or partially humanitarian
- whether or not the War accomplished anything useful for the Cuban people
- whether or not the United States actions were proportionate to the causes
- whether tobacco and sugar interests were primary or secondary considerations
- whether or not the United States knew the true story behind the sinking of the *Maine*

b) Roosevelt's view is that humanitarian concerns in Cuba outweighed American strategic interests in the region. This question is asking for an event or development to support his view. You could have used one of the following:

- the Monroe Doctrine
- the Cuba Libre movement based in Florida
- church support for Cuban independence
- heavy-handed tactics by the Spanish to quell a Cuban revolt
- the refusal of the Spanish government to accept negotiations with President McKinley

c) Atwood's view is that the Spanish-American war was based on lies and propaganda. Lodge's quote seems to suggest that the United States had selfish reasons for wanting war against Spain and was simply waiting for an excuse to strike. This question is asking for an event or development to support his view. You could have used one of the following:

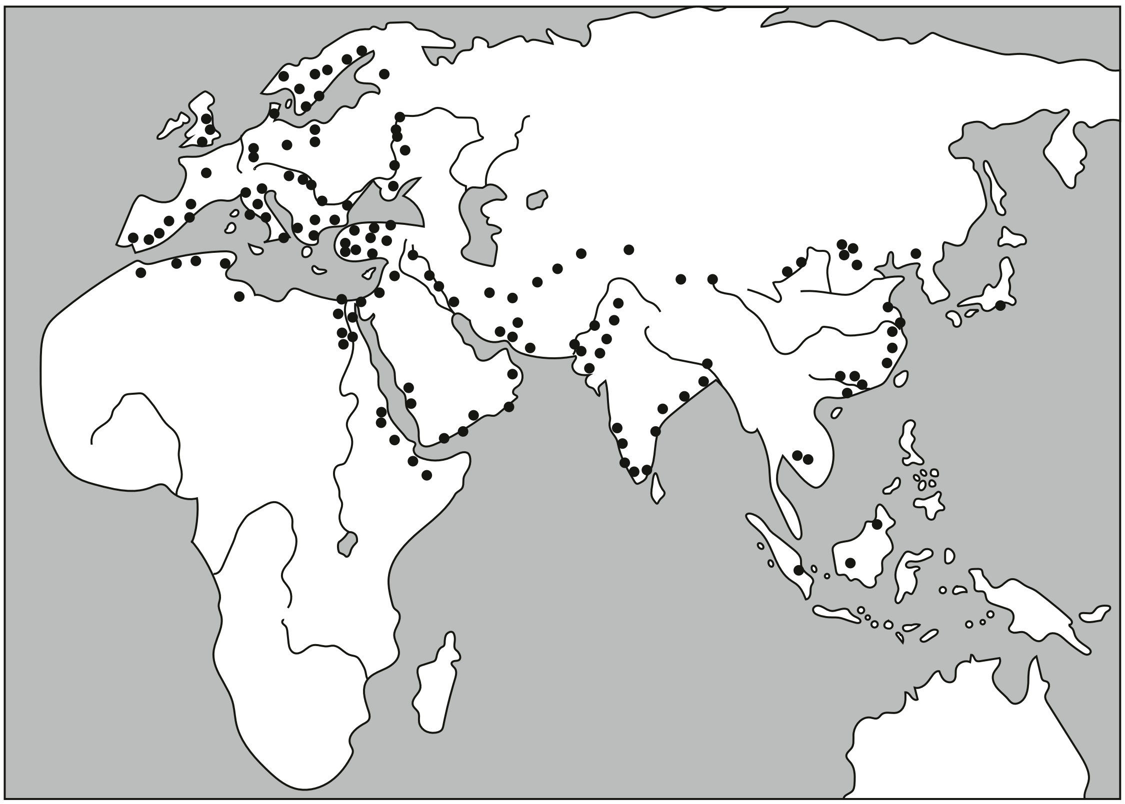
- Joseph Pulitzer's and William Randolph Hearst's used newspapers to gin up anger against Spain ("yellow journalism").
- Before the Civil War, the South attempted to acquire Cuba to expand slave territory.
- In 1894, 90% of Cuba's total exports went to the United States.
- Uncertainty about the future of Cuba harmed American business interests. Sugar merchants lobbied Washington for an end to the instability.
- After the War, the U.S. not only aided Cuba in getting its independence, but also acquired an indefinite lease to Guantanamo Bay (the Platt Amendment), and territorial rights to Guam and the Philippines.



AP World History: Modern Free-Response Question

1. **Use the map below to answer all parts of the question that follows.**

Locations of Archaeological Finds of Byzantine Currency



a) Identify and explain TWO factors in the period 1200 to 1450 that account for the pattern of the Byzantine currency finds on the map.

b) Identify and explain ONE reason that the Byzantine currency finds declined after 1450.

AP World History: Modern Explanation

Question 1

a) Your response should account for the spread of the *currency* in the period spanning 1200 to 1450. Your response should also discuss the Byzantine Empire as a wealthy trading nation whose currency was used worldwide (according to the map). Factors you might include are contact and conflict with the Muslim world (to explain the Middle East), Silk Road trade routes (to explain the easterly locations in Asia), and trading links with Western Europe. Your response might also touch upon the Byzantine coinage as having worldwide recognition.

b) A successful response will focus on the gradual decline of Byzantium, with its end more or less accounted for by the Ottoman conquest of Constantinople in 1453. Your response might also include the economic decline of the Byzantine Empire and the city of Constantinople as well as the invasion of Anatolia by Turkish, Mongolian, and Timurid invaders through 1420.

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