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3. (a)

[Midpoint Rule]

$\Delta x = \frac{b-a}{n}$ 이고, $\bar{x}_i = \frac{1}{2}(x_{i-1} + x_i)$. 즉 \bar{x}_i 가 $[x_{i-1}, x_i]$ 의 중간점일 때,

$$\int_a^b f(x) dx \approx \Delta x \{ f(\bar{x}_1) + f(\bar{x}_2) + f(\bar{x}_3) + \dots + f(\bar{x}_{n-1}) + f(\bar{x}_n) \}$$

$$\int_0^{40} v(t) dt \approx \Delta t \{ v(\bar{t}_1) + v(\bar{t}_2) + v(\bar{t}_3) + v(\bar{t}_4) \}$$

$$= 10 \{ v(6) + v(16) + v(26) + v(36) \}$$

$$= 10 \{ 0.2 + 7.0 + 2.4 + 4.3 \}$$

$$= 229 \text{ (miles)}$$

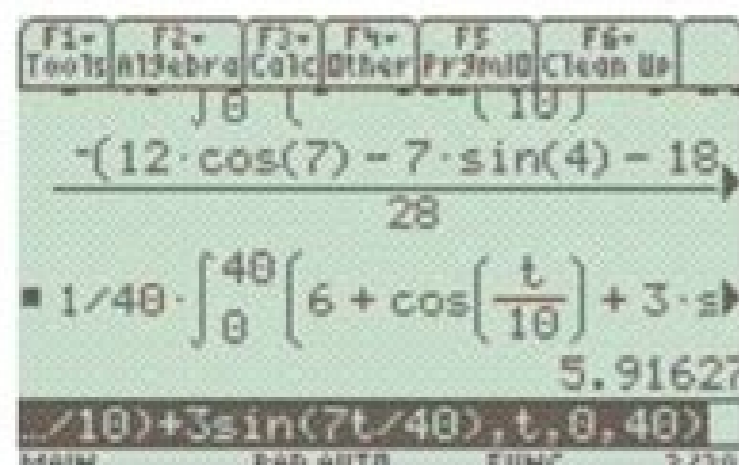
$t=0$ 일 때 출발한 비행기가 $t=40$ 까지 비행했을 때의 변위(상대위치)를 의미한다.
(즉, $t=40$ 일 때 비행기 위치는 $t=0$ 일 때 위치보다 양(+)의 방향으로 229miles 떨어져 있다.)

(b) $v(t)$ 는 t 에 대해 미분가능하고, 가속도 $a(t) = v'(t)$ 로 나타낼 수 있다.
주어진 표에서 $v(0) = v(15) = 7.0$, $v(25) = v(30) = 2.4$ 이므로
롤의 정리(Rolle's rule)에 의해 $0 < t < 15$, $25 < t < 30$ 에서 $v'(t) = 0$ 인 곳이 적어도 하나 존재한다.
따라서 $0 < t < 40$ 에서 적어도 두 곳에서 $v'(t) = 0$ 인 곳이 존재한다.

(c) $f(t) = 6 + \cos\left(\frac{t}{10}\right) + 3\sin\left(\frac{7t}{40}\right)$ 에서 $f'(t) = -\frac{1}{10}\sin\left(\frac{t}{10}\right) + \frac{21}{40}\cos\left(\frac{7t}{40}\right)$

$$f'(23) = -\frac{1}{10}\sin\left(\frac{23}{10}\right) + \frac{21}{40}\cos\left(\frac{7 \cdot 23}{40}\right) \approx -0.407604 \text{ (miles/min}^2\text{)}$$

(d) average velocity = $\frac{1}{40-0} \int_0^{40} f(t) dt$
 $= \frac{1}{40} \int_0^{40} 6 + \cos\left(\frac{t}{10}\right) + 3\sin\left(\frac{7t}{40}\right) dt$
 $= 5.91627 \text{ (miles/min)}$



a. Since $k > 0$, $y = x^k(k-x)$ has zeros at $x=0, k$ and is above the x-axis between the two x points. The area under the curve then is $\int_0^k (kx^k - x^{k+1}) dx$. Set this equal to 2 and solve. $\int_0^k (kx^k - x^{k+1}) dx = 2 \rightarrow \left[\frac{kx^{k+1}}{k+1} - \frac{x^{k+2}}{k+2} \right]_0^k = 2 \rightarrow \frac{k^{k+2}}{k+1} - \frac{k^{k+2}}{k+2} = 2 \rightarrow k^{k+2} \left(\frac{1}{k+1} - \frac{1}{k+2} \right) = 2 \rightarrow k^{k+2} \left(\frac{k+2 - k-1}{(k+1)(k+2)} \right) = 2 \rightarrow k^{k+2} \left(\frac{1}{(k+1)(k+2)} \right) = 2$
 b. Rotating this around the x-axis would be a disc: $\pi \int_0^k (kx^k - x^{k+1}) dx$
 c. You would use the arc length formula—length L of curve $f(x)$ on interval $[a,b]$ is $L = \int_a^b \sqrt{1+(f'(x))^2} dx$ —and then add the x-axis line side which has length k .
 $L = k + \int_0^k \sqrt{1+(kx^k - x^{k+1})'^2} dx$

The problem on this video is copyrighted by Collegeboard

2. The figure above shows the polar curves $r = f(\theta) = 1 + \sin \theta \cos(2\theta)$ and $r = g(\theta) = 2 \cos \theta$ for $0 \leq \theta \leq \frac{\pi}{2}$. Let R be the region in the first quadrant bounded by the curve $r = f(\theta)$ and the x-axis. Let S be the region in the first quadrant bounded by the curve $r = f(\theta)$, the curve $r = g(\theta)$, and the x-axis.

(a) Find the area of R . $A = \frac{1}{2} \int_0^{\pi/6} (1 + \sin \theta \cos 2\theta)^2 d\theta \approx 0.648 \text{ unit}^2$

(b) The ray $\theta = k$, where $0 < k < \frac{\pi}{6}$, divides S into two regions of equal area. Write, but do not solve, an integral(s) that can be used to find k .

(c) For each θ , $0 \leq \theta \leq \frac{\pi}{2}$, let $w(\theta)$ be the distance between the points with polar coordinates $(f(\theta), \theta)$ and $(g(\theta), \theta)$.

2007 (form B) AP Calculus AB-BC FRQ 4

a) Local maxima occur where f' changes sign from '+' to '-' as we go from left to right, which occurs at $x = -3, 4$. If we are to consider endpoints, $x = -5$ is ruled out because f' is just to the right of -5 is positive, and $x = 5$ is ruled out because $f'(5)$ is negative.

b) Points of inflection occur where f'' changes sign, which happens at $x = -4, -1$, and 2 .

c) concave up is same as $f'' > 0$ (on the graph at right, that is slope is 0) which occurs $-5 < x < -4$ and $-1 < x < 2$ positive slope is same as $f' > 0$ (on the graph at right where height is).

relative min/max:
 where f' changes sign
 • $f'(x) = 0$ or
 • $f'(x)$ D.N.E.
 = endpoints

point of inflection:
 where f'' changes sign

concave up = $f''(x) > 0$

$f(b) = f(a) + \int_a^b f'(x) dx$

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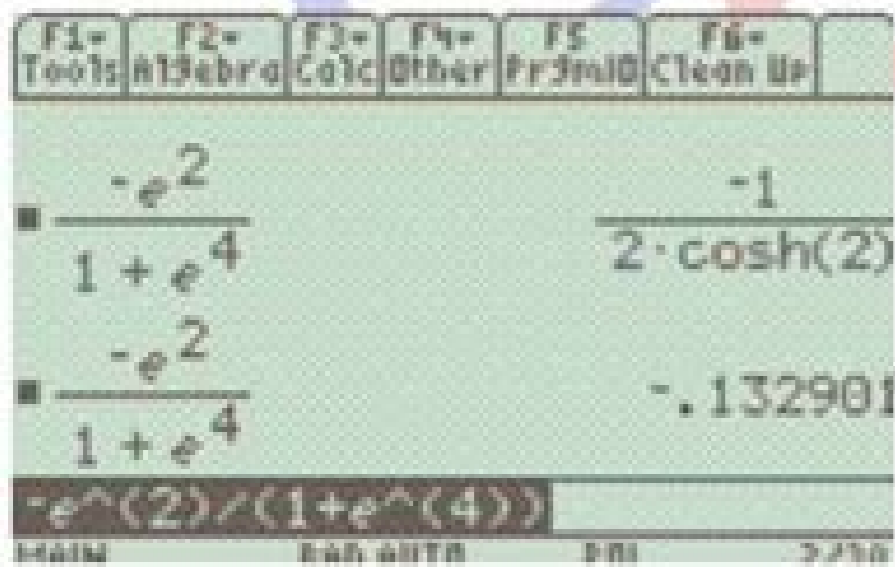
3. (a) $v(t) = 1 - \tan^{-1}(e^t)$ 에서 $y = \tan^{-1}(e^t)$ 라 하면,

$\tan y = e^t$ 이고 양변을 t 에 대해 미분하면

$$\sec^2 y \frac{dy}{dt} = e^t \quad \therefore \frac{dy}{dt} = \frac{e^t}{\sec^2 y} = \frac{e^t}{1 + \tan^2 y} = \frac{e^t}{1 + e^{2t}}$$

$$a(t) = v'(t) = - \frac{e^t}{1 + e^{2t}}$$

$$\therefore a(2) = v'(2) = - \frac{e^2}{1 + e^4} \approx -0.132901$$



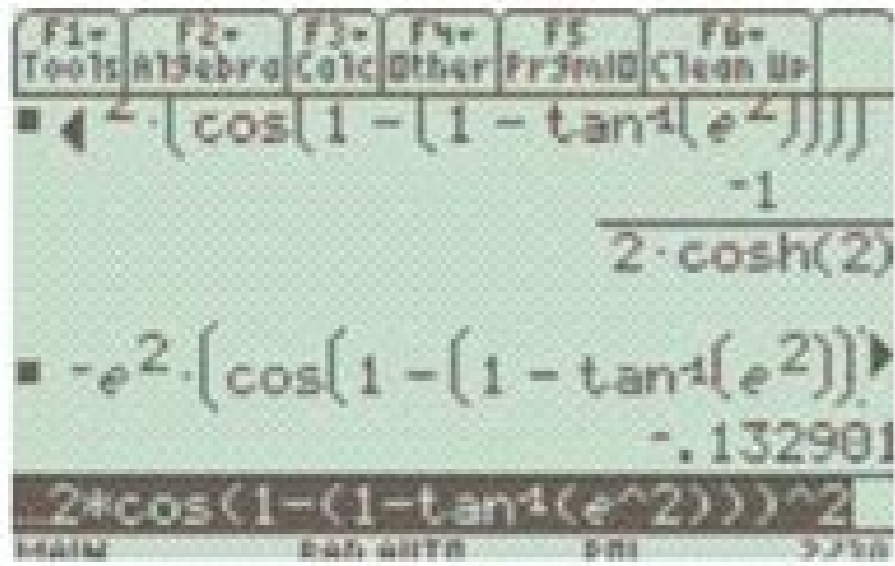
참고) 다른 풀이

$$\tan^{-1}(e^t) = 1 - v(t) \quad \therefore e^t = \tan(1 - v(t))$$

양변을 t 에 대해 미분하면

$$e^t = \sec^2(1 - v(t)) \cdot (-v'(t)) \quad \therefore v'(t) = -e^t \cos^2(1 - v(t))$$

$$a(2) = v'(2) = -e^2 \cos^2(1 - v(2)) = -e^2 \cos^2(1 - (1 - \tan^{-1}(e^2))) = -0.132901$$



(b) $v(2) = 1 - \tan^{-1}(e^2) \approx -0.436278 < 0$ 이고,

$$a(2) = v'(2) = - \frac{e^2}{1 + e^4} \approx -0.132901 < 0 \text{ 이므로}$$

물체의 속력은 증가하고 있다.

2008 ap calculus bc frq form b.

Cryogenic split-body ball valves; Cryogenic top-entry ball valves; VTP-2000 high performance three-piece ball valves; VTP-2000 three-piece ball valves; Valvac general purpose ball valves; VOP-1000 one-piece ball valves; VEE-2000 end-entry ball valves; V3P-1000 three-piece ball valves; Securaseal metal-seated ball valves. Cast split-body flanged. 7h ago2022. 5. 19. - However, if distortion is severe • manual lever or any surfaces are heavily scored, the valve body • manual lever shaft seal, washer, E-clip and. 1 day ago - Valve Body 42re Manual - m.studyin-uk.com Valve-Body-42re-Manual 1/2 PDF Drive - Search and download PDF files for free.Valve Body 42re Manual [Book] Valve Body 42re Manual When people should go to the 7h agoTransGo Shift Kits include everything you need to address the most common transmission driveability complaints and failures in one box. Shift Kits are engineered to restore hydraulic integrity with easy-to-install and cost-effective solutions. Take your transmission to the next level without sacrificing durability with TransGo Reprogramming kits. 10h agohow to control boost on a turboA518 (46RH/46RE) The A518, later renamed 46RH (hydraulic controlled governor pressure) and 46RE (electronic controlled governor pressure), is an A727 derivative with overdrive, in the A500 ilk. Starting in 1990, it was used in some trucks and. 11h agoThe 42RL Engine In Ono Jeep Models. The 42RL transmission was not only used in the Jeep Liberty, it was also used in the Jeep JK Wranglers (2007 to 2013) and the TJ/TJL Wranglers (2003 to 2006). The transmissions are known to have some quirky problems now and then, and given how much they rely on electronics, that's not surprising. 7h ago30/32rh master kit 3 seal, input shaft 2 seal ring, kickdown servo ... 1 seal, manual valve lever 1 gasket, transmission oil pump 1 retainer and seal, trans underdrive 3 seal, input shaft ... 4 check ball, valve body 1 o-ring, oil filler tube 1 o-ring, transmission sump. 14h ago husqvarna sewing machine replacement partsbusiness reflective essay examples13h agoProduct Description. ALLISON 1000 High Performance. Rebuilt. Updated Valve Body. Specially Calibrated For Use With Our Level 2, 3, 4 and 5 Torque Converters (can be used with other manufacturers torque converters as well) Core Return Required. Perfect For Modified or Stock Engines. Increased Transmission Durability. Lower Transmission Temperatures. 11h ago islamorada wedding packages1 screen, transmission regulator valve 1 seal, rear clutch retainer. 1.75 od 3 seal, governor support 1 filter, valve body 1 gasket, transmission oil pump 1 gasket, transmission fluid filter 1 seal, reverse servo piston 3 seal, input shaft 2 gasket, lock-up solenoid 1 seal, impeller hub 57.25mm od 2 seal, trans differential 1 seal, manual shift. 7h ago5onnax valve body layouts provide a detailed overview of individual units making it quick and easy to determine what's available for the specific valve body you're working on. Each layout: Displays an exploded view location guide for individual valve trains. Identifies symptoms and recommended solutions for quality rebuilds. With more than. 10h agoshift by news todayHowever, if distortion is severe • manual lever or any surfaces are heavily scored, the valve body • manual lever shaft seal, washer, E-clip and detent will have to be replaced. ball • fluid filter CAUTION: The throttle valve, shuttle valve plug, 1-2 • converter clutch solenoid shift valve and 1-2 governor plug are made of The remaining. 11h ago32rh 36rb 3at 3l30 3l80 3n71b 3l40 4-speed manual 40te 4139 4141 41ae 41te 42le 42re 42rh 42rl 440t4 44re 450-43le 45rfe 46re 46rh 47re 47rh 48re 4eat 4eat-f 4eat-g 4eat-gf 4f20e 4f27e 4f50n 4l30e ... 6-speed manual 60te 62te 65rfe 66rfe 68rfe 6as-420 6dct150 6dct250 6dct450 6dct451 6dct470 6dt25 6dt35 6dt45 6f15 6f24 6f35 6f50 6f50n 6f55 6f45. 11h ago michigan tree nursery wholesaleChrysler A727, A904 Valve Body Layout. January 01, 2013. Chrysler A727, A904 Throttle Link Adjustment. Valve Body Xpress. May 16, 2010. Transmission Report: The Art of Proper Bore Reaming. November 22, 2008. Chrysler RWD Valve Body Linkage Pivoting Wear. Gregg Nader. November 26, 2004. The Cure for the Common (Chrysler RWD) Cold. On some vehicles, a failing camshaft sensor may lock the transmission in a single gear until you turn off and restart the engine. This cycle may repeat intermittently. If the sensor begins to fail while your car is moving, you may feel the car jerking while losing power. You may experience a noticeable loss of engine power. 12h ago13h agoATP has released 25 new numbers in the Powertrain category including Automatic and Manual Transmission Shift, Detent, Accelerator and Clutch Cables, along with Automatic Transmission Flexplates and a Manual Flywheel. 10h agoakurum cabinets ikea2022. 7. 29. - Search: 1978 Dodge Motorhome Transmission. I am an RV fanatic and I cannot even attempt to try to put into words my love of the RV lifestyle as well as my love of vintage and classic motorhomes Reference our motorhome gas mileage chart to ensure you are getting the best gas mileage for your RV Chrysler 1960-1969 / Chrysler 1970-1979 / Dodge 1960-1969 /. 11h agoChrysler Transmission Dipstick CR1933 Charts included Chrysler, Dodge and Jeep Applications This dipstick is used on all vehicles equipped with a NA61, Dodge, 42RLE, CVT Transmission and the 62TE Transaxle Find out how much engine oil does your car need It is locate between the battery and the engine, actually, the top of it is a little bit lower than. 11h agoflicker codes 2021 Advanced Placement course and exam Not to be confused with AP English Literature and Composition. This article is part of a series onAdvanced Placement Exams • Awards AP Capstone Seminar (AP Capstone Part 1) Research (AP Capstone Part 2) Current subjects Art History Biology Calculus (AB & BC) Chemistry Chinese Language and Culture Comparative Government & Politics Computer Science A Computer Science Principles English Language & Composition English Literature & Composition Environmental Science European History French Language and Culture German Language and Culture Human Geography International English Language Italian Language and Culture Japanese Language and Culture Latin Macroeconomics Microeconomics Music Theory Physics 1: Algebra-based Physics 2: Algebra-based Physics C: Electricity and Magnetism Physics C: Mechanics Psychology Spanish Language and Culture Spanish Literature and Culture Statistics Studio Art (2-D, 3-D, & Drawing) U.S. Government & Politics U.S. History World History: Modern In development African American Studies Russian Language and Culture World History: Ancient Precalculus Former subjects Computer Science AB French Literature German Literature Latin Literature Latin: Vergil Physics B Physics C vte Advanced Placement (AP) English Language and Composition (also known as AP English Language, APENG, or AP Lang) is a course and examination offered by the College Board as part of the Advanced Placement Program. When AP exams were first implemented, English Language and English Literature were initially combined. They separated in 1980. Course AP English Language and Composition is a course in the study of rhetoric taken in high school. Many schools offer this course primarily to juniors and the AP English Literature and Composition course to seniors. Other schools reverse the order, and some offer both courses to both juniors and seniors. The College Board advises that students choosing AP English Language and Composition be interested in studying and writing various kinds of analytic or persuasive essays on non-fiction topics, while students choosing AP English Literature and Composition be interested in studying literature of various periods and genres (fiction, poetry, drama) and using this wide reading knowledge in discussions of literary topics.[1] Exam Format The AP English Language and Composition exam is typically administered on a Wednesday morning in the second week of May. The exam consists of two sections: a one-hour multiple-choice section, and a two-hour fifteen-minute free-response section.[2] The exam is further divided as follows: # of Questions Percentage of score Time Allowed Section I: Multiple-Choice Approximately 55 45 60 Minutes Section II: Free-Response 3 55 15 minutes (reading portion)120 minutes (writing portion) Section I: Multiple-Choice This section needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed. (May 2016) (Learn how and when to remove this template message) The Free-Response section of the test consists of three prompts, each of a different type: synthesis, passage analysis, and argument. Each is scored on a scale from 0 to 6. With the introduction of the synthesis essay in 2007, the College Board allotted 15 additional minutes to the free-response exam portion to allow students to read and annotate the three prompts, as well as the passages and sources provided. During the reading time, students may read the prompts and examine the documents. They may use this time to make notes, or begin writing their essay. The synthesis prompt typically requires students to consider a scenario, then formulate a response to a specific element of the scenario using at least three of the accompanying sources for support. While a total of six or seven sources accompany the prompt, using information from all of the sources is not necessary, and may even be undesirable. The source material used must be cited in the essay in order to be considered legitimate. The analysis prompt typically asks students to read a short (less than 1 page) passage, which may have been written at any time, as long as it was originally written in modern English. After reading the passage, students are asked to write an essay in which they analyze and discuss various techniques the author uses in the passage. The techniques differ from prompt to prompt, but may ask about strategies, argumentative techniques, motivations, or other rhetorical elements of the passage, and how such techniques effectively contribute to the overall purpose of the passage. The prompt may mention specific techniques or purposes, but some leeway of discussion is left to the student. The argument prompt typically gives a position in the form of an assertion from a documented source. Students are asked to consider the assertion, and then form an argument that defends, challenges, or qualifies the assertion using supporting evidence from their own knowledge or reading. Scoring The multiple-choice section is scored by computer. Formerly, the test was scored by awarding 1 point for correct answers, while taking off a 1/4 point for incorrect answers. No points were taken away for blank answers. However, the College Board discontinued the policy for all AP Exams in 2011; now they only award 1 point for each correct answer, with no 1/4 point deductions. The free-response section is scored individually by hundreds of educators each June. Each essay is assigned a score from 0-6, 6 being high. Scoring is holistic, meaning that specific elements of the essay are not assessed, but each essay is scored in its entirety. The FRQ scoring was changed in 2019 from a 9 point scale. The scores from the three essays are added and integrated with the adjusted multiple-choice score (using appropriate weights of each section) to generate a composite score. The composite is then converted into an AP score of 1-5 using a scale for that year's exam.[4] Students generally receive their scores by mail in mid-July of the year they took the test. Alternately, they can receive their scores by phone as early as July 1 for a fee.[5] Sub-scores are not available for students for the English Language and Composition Exam. Instructors of all AP courses each receive a score sheet showing the individual score for each of their students, as well as some score information and national averages. Grade distributions The grade distributions since 2008 are shown below: Year Score percentages 5 4 3 2 1 % of Scores 3 or Higher Mean Standard Deviation Number of Students 2008[6] 8.7% 18.2% 31.4% 30.5% 11.3% 58.3% 2.83 1.12 306,479 2009[7] 10.5% 19.0% 30.2% 28.4% 11.9% 59.7% 2.88 1.16 337,441 2010[8] 10.7% 20.8% 29.3% 27.6% 11.6% 60.8% 2.91 1.17 374,620 2011[9] 11.1% 20.0% 30.1% 27.5% 11.3% 61.2 2.92 1.17 412,466 2012[10] 11.0% 20.2% 28.9% 27.9% 11.9% 60.1% 2.90 1.18 443,835 2013[11] 10.2% 16.2% 28.6% 29.8% 15.2% 55.0% 2.76 1.19 476,277 2014[12] 9.6% 17.9% 28.4% 30.1% 14.1% 55.9% 2.79 1.18 505,244 2015[13] 9.9% 18.3% 27.3% 29.7% 14.8% 55.5% 2.79 1.19 527,274 2016[14] 10.7% 17.6% 27.1% 32.1% 12.6% 55.4% 2.82 1.18 547,575 2017[15] 9.1% 18.4% 27.8% 30.7% 14% 55.3% 2.78 1.17 579,426 2018[16] 10.6% 17.7% 28.8% 29.3% 13.5% 57.1% 2.83 1.18 580,043 2019[17] 10.1% 18.5% 26.5% 31.1% 13.8% 55.1% 2.80 1.19 573,171 2020[18] 12.6% 20.4% 29.1% 26.2% 11.8% 62.1% 2.96 1.20 535,478 2021[19] 8.0% 23.0% 26.0% 31.0% 12.0% 57.0% 2.86 1.18 518,548 2022[20] 10.2% 21.0% 21.0% 30.0% 14.5% 52.2% After 2010, the AP English Language and Composition test overtook the AP United States History test as the most taken in the AP program.[21] Composite score range The College Board has released information on the composite score range (out of 150) required to obtain each grade:[22] This score table is not absolute, and the ranges vary with each administration of the test. With the addition of the synthesis essay in 2007, the scoring tables were revised to account for the new essay type in Section II of the test. Final Score Range (2001) Range (2002) 5 108-150 113-150 4 93-107 96-112 3 72-92 76-95 2 43-71 48-75 1 0-42 0-47 Recent changes In 2007, there was a change in the multiple choice portion of the exam. Questions began to be included about documentation and citation. These questions are based on at least one passage which is a published work, including footnotes or a bibliography. References ^ "AP English Course Description" (PDF). College Board. 2008. p. 12. students choosing AP English Language and Composition should be interested in studying and writing various kinds of analytic or persuasive essays on nonliterary topics, and students choosing AP English Literature and Composition should be interested in studying literature of various periods and genres and using this wide reading knowledge in discussions of literary topics. ^ "AP: English Language". Archived from the original on 2004-08-19. Retrieved 2007-06-03. ^ a b "AP English Language and Composition Exam Dates and Information - AP Students - The College Board". apstudent.collegeboard.org. Retrieved 2017-01-25. ^ "About AP Scores - The College Board". www.collegeboard.com. Archived from the original on 2008-12-18. Retrieved 10 April 2018. ^ "View Your Scores on AP Exams - The College Board". www.collegeboard.com. Archived from the original on 2008-12-01. Retrieved 10 April 2018. ^ "AP English Language and Composition Student Grade Distributions: AP Examinations - May 2008" (PDF). College Board. ^ "AP English Language Student Grade Distributions - Global: AP Examinations - May 2009" (PDF). College Board. ^ 2010 Grade Distribution ^ "AP English Language Student Score Distributions - Global: AP Exams - May 2011" (PDF). College Board. ^ "AP English Language Student Score Distributions - Global: AP Exams - May 2012" (PDF). College Board. ^ "2013 AP Exam Score Distributions". totalregistration.net. Retrieved 10 April 2018. ^ "2014 AP Exam Score Distributions". totalregistration.net. Retrieved 10 April 2018. ^ "2015 AP Exam Score Distributions". www.totalregistration.net. Retrieved 10 April 2018. ^ "2016 AP Exam Score Distributions". www.totalregistration.net. Retrieved 10 April 2018. ^ "STUDENT SCORE DISTRIBUTIONS: AP Exams - May 2017" (PDF). College Board. ^ "STUDENT SCORE DISTRIBUTIONS" (PDF). 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