AP Calculus AB Sample Test II -- Part B Name: _____
Multiple Choice, Calculator Active Period: _____

In This Test:

1) Unless otherwise specified, the domain of a function *f* is assumed to be the set of all real numbers *x* for which f(*x*) is a real number.

2) The <u>exact</u> numerical value of the correct answer does not always appear among the choices given. When this happens, select from among the choices, the number that <u>best approximates</u> the exact numerical value.

26. If f is a function such that $\lim_{x\to a}\frac{f(x)-f(a)}{x-a}=0$, which of the following must be true?

a. $\lim_{x\to a} f(x)$ does not exist
b. $f(a)$ does not exist
c. $f'(a)=0$
d. $f(a)=0$
e. $f(x)$ is continuous at $x = 0$

27. If $f(x)=\sqrt{(x^2+2)^3}$, $f'(x)=$

a. $\frac{3\sqrt{x^2+2}}{2}$ b. $3x\sqrt{x^2+2}$
c. $\sqrt{6x\left(x^2+2\right)^2}$ d. $\frac{3x}{\sqrt{x^2+2}}$
e. $\frac{4x}{3\sqrt[3]{x^2+2}}$

28. Of the choices given, which value is NOT in the domain of the function $f(x)=(\cos x)^x$?

a. 1 b. $\frac{\pi}{2}$ c. $\frac{4\pi}{3}$ d. 4 e. 2π

29. If f is a function, which is everywhere increasing and concave upwards, which statement is true about f^{-1}, the inverse of f?

a. f^{-1} is not a function.
b. f^{-1} is increasing and concave upwards.
c. f^{-1} is increasing and concave downwards.
d. f^{-1} is decreasing and concave upwards.
e. f^{-1} is decreasing and concave downwards.

30. A function whose derivative is a constant multiple of itself must be:

a. periodic b. linear c. exponential
d. quadratic e. logarithmic

31. For how many real numbers x is it true that $\sin x=\frac{x}{10}$?

a. 3 b. 5 c. 6 d. 7 e. Infinitely many

32. What is the 50th derivative of cos *x*?

a. –cos *x* b. cos *x* c. sin *x* d. –sin *x* e. 0

33. The <u>derivative</u> of f is given by $f'(x)=e^x(-x^3+3x)-3$ for $0\le x\le 5$. At what value of x is $f(x)$ a minimum?

a. For no value of *x* b. 0
c. 0.653 d. 1.604
e. 5

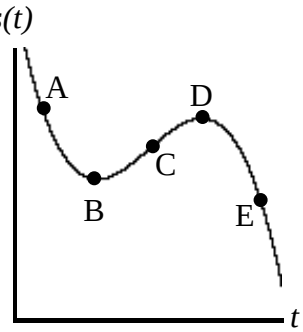
34. In the interval $0\le x\le 5$ the graphs of $y = \cos 2x$ and $y = \sin 3x$ intersect four times. Let *A*, *B*, *C*, and D be the *x*-coordinates of these points so that $0 < A < B < C < D < 5$. Which of the definite integrals below represents the largest number?

a. $\int_0^A(\cos 2x-\sin 3x)dx$ b. $\int_A^B(\sin 3x-\cos 2x)dx$
c. $\int_B^C(\sin 3x-\cos 2x)dx$ d. $\int_C^D(\cos 2x-\sin 3x)dx$
e. $\int_C^D(\sin 3x-\cos 2x)dx$

35. Suppose that f is a continuous function defined for all real numbers x and $f(-5) = 3$ and $f(-1) = -2$. If $f(x) = 0$ for one and only one value of x, then which of the following could be x?

a. –7 b. –2 c. 0 d. 1 e. 2

36. The graph to the right shows the distance $s(t)$ from a reference point of a particle moving on a number line, as a function of time. Which of the points marked is closest to the point where acceleration first becomes negative?



a. *A* b. *B* c. *C* d. *D* e. *E*

37. $\frac{d}{dx}\int_{x}^{x^3} \sin(t^2)dt =$

a. $\sin(x^6) - \sin(x^2)$ b. $6x^2 \sin(x^3) - 2\sin x$

c. $3x^2 \sin(x^6) - \sin(x^2)$ d. $6x^5 \sin(x^6) - 2\sin(x^2)$

e. $2x^3 \cos(x^6) - 2x\cos(x^2)$

38. Let *f(x)* be a continuous function on the closed interval [1, 4]. If $5 \le f(x) \le 9,$ then the least possible value for $\int_1^4 f(x)dx$ is:

a. 15 b. 3 c. 4 d. 27 e. 31

39. The function $f(x) = \tan(3^x)$ has one zero in the interval [0, 1.4]. The derivative at this point is:

a. 0.411 b. 1.042 c. 3.451
d. 3.763 e. undefined

40. The region in the first quadrant enclosed by the graph $y = x$ and $y = 2\sin x$ is revolved around the x-axis. The volume of the resulting solid figure is:

a. 1.895 b. 2.126 c. 5.811
d. 6.678 e. 13.355

26. C	31. D	36. C
27. B	32. A	37. C
28. C	33. E	38. A
29. C	34. D	39. C
30. C	35. B	40. D