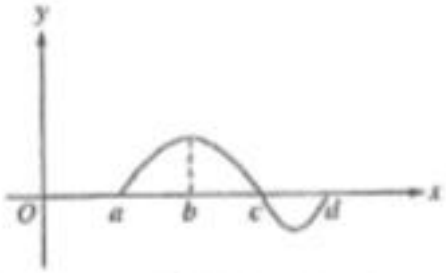
AP Exam Review MC 5 **#66-69, 71-75 #1-3 NON-CALCULATOR except #68, 73 & 75**
Google Form MC Entry **(12 questions)**

66. The graph of f is shown in the figure on the right.

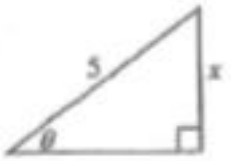
If $g(x)=\int_a^x f(t)\,dt$, for what value of x does $g(x)$ have a maximum?

(A) a (B) b (C) c (D) d
(E) It cannot be determined from the information given.



67. In the triangle shown on the right, if θ increases at a constant rate of 3 radians per minute, at what rate is x increasing in units per minute when $x=3$ units?

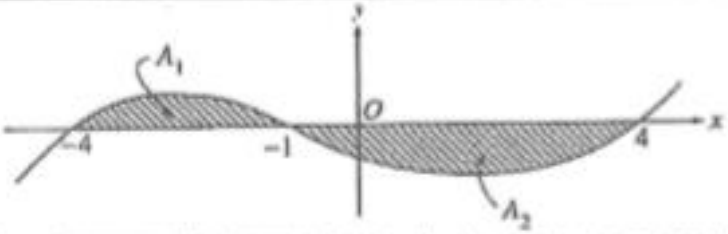
(A) 3 (B) $\frac{15}{4}$ (C) 4 (D) 9 (E) 12



68. (Calc) The velocity, in ft/sec, of a particle moving along the x-axis is given by the function $v(t)=e^t+te^t$. What is the average velocity of the particle from time $t=0$ to time $t=3$?

(A) 20.086 ft/sec (B) 26.447 ft/sec (C) 32.809 ft/sec (D) 40.671 ft/sec (E) 79.342 ft/sec

69.



The graph of $y=f(x)$ is shown in the figure above. If A_1 and A_2 are positive numbers that represent the areas of the shaded regions, then in terms of A_1 and A_2, $\int_{-4}^{4} f(x)\,dx-2\int_{-1}^{4} f(x)\,dx=$

(A) A_1 (B) A_1-A_2 (C) $2A_1-A_2$ (D) A_1+A_2 (E) A_1+2A_2

71. $\lim_{h\to 0}\frac{\ln(e+h)-1}{h}$ is

(A) $f'(e)$, where $f(x)=\ln x$
(B) $f'(e)$, where $f(x)=\frac{\ln x}{x}$
(C) $f'(1)$, where $f(x)=\ln x$
(D) $f'(1)$, where $f(x)=\ln(x+e)$
(E) $f'(0)$, where $f(x)=\ln x$

72. Let f be a continuous function on the closed interval $[-3, 6]$. If $f(-3) = -1$ and $f(6) = 3$, then the Intermediate Value Theorem guarantees that

(A) $f(0) = 0$

(B) $f'(c) = \frac{4}{9}$ for at least one c between -3 and 6

(C) $-1 \le f(x) \le 3$ for all x between -3 and 6

(D) $f(c) = 1$ for at least one c between -3 and 6

(E) $f(c) = 0$ for at least one c between -1 and 3

73. (Calc) Let g be the function given by $g(x) = \int_0^x \sin(t^2)\,dt$ for $-1 \le x \le 3$. On which of the following intervals is g decreasing?

(A) $-1 \le x \le 0$ (B) $0 \le x \le 1.772$ (C) $1.253 \le x \le 2.171$

(D) $1.772 \le x \le 2.507$ (E) $2.802 \le x \le 3$

74. If $f''(x) = x(x+1)(x-2)^2$, then the graph of f has inflection points when $x =$

(A) -1 only (B) 2 only (C) -1 and 0 only

(D) -1 and 2 only (E) -1, 0, and 2 only

75. (Calc) A particle moves along the x-axis so that any time $t > 0$, its acceleration is given by $a(t) = \ln(1 + 2^t)$. If the velocity of the particle is 2 at time $t = 1$, then the velocity of the particle at time $t = 2$ is

(A) 0.462 (B) 1.609 (C) 2.555 (D) 2.886 (E) 3.346

1. If $y = (2x^2 + 1)^4$, then $\frac{dy}{dx} =$

(A) $16x^3$ (B) $4(2x^2 + 1)^3$ (C) $4x(2x^2 + 1)^3$

(D) $16(2x^2 + 1)^3$ (E) $16x(2x^2 + 1)^3$

2. $\int x\sqrt{x^2 + 1}\,dx =$

(A) $\frac{x}{\sqrt{x^2 + 1}} + C$ (B) $\frac{3}{4}(x^2 + 1)^{\frac{3}{2}} + C$ (C) $\frac{1}{3}(x^2 + 1)^{\frac{3}{2}} + C$

(D) $\frac{2}{3}(x^2 + 1)^{\frac{3}{2}} + C$ (E) $\frac{1}{3}x^2(x^2 + 1)^{\frac{3}{2}} + C$

3. If $\frac{dy}{dx} = 2xy$, then $\frac{d^2y}{dx^2} =$

(A) $2y$ (B) $2x + 2y$ (C) $2x + 4y$ (D) $2x^2y + 2y$ (E) $4x^2y + 2y$