الرياضيات

للصف الثاني عشر متقدم

الفصل الدراسي الثاني ٢٠٢٣/٢٠٢٤

152 سؤال اختيار من متعدد

لاتُغني عن الكتاب المدرسي

Unit 5 الوحدة الخامسة

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الشُعبة/ ______________________

إعداد الاستاذ

علي عبد الله

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In English

1) $\int \frac{5}{1+x^2}\,dx$ is equal to

A. $5\ln(1+x^2)+c$ **B.** $5\tan^{-1}x+c$

C. $5\tan^{-1}x^2$ **D.** $\frac{5}{x}\ln(1+x^2)+c$

2) $\int x\sqrt{4-x^2}\,dx$ is equal to

A. $\frac{(4-x^2)^{3/2}}{3}+c$ **B.** $-\frac{(4-x^2)^{3/2}}{3}+c$

C. $-\frac{x^2(4-x^2)^{3/2}}{3}+c$ **D.** $-(4-x^2)^{3/2}+c$

3) The value of integral $\int_0^5 \frac{[\![x]\!]\,e^{[\![x]\!]}}{e^{x-1}}\,dx$ is equal to

A. $10(e-1)$ **B.** $5(e-1)$

C. $10(1-e)$ **D.** $10(e+1)$

Note: $[\![x]\!]$ represent the greatest value of x

4) $\int_1^2 \frac{x-4}{x^2}\,dx$ Is equal to

A. 2 **B.** $\ln 2+2$

C. $\ln 2-2$ **D.** $\ln 2$

5) $\int_0^1 \frac{x+1}{x^2+2x+3}\,dx$ Is equal to

A. $\ln 2$ **B.** $-\ln 2$

C. $\frac{\ln 2}{2}$ **D.** $\frac{1-\ln 2}{2}$

6) The average value of $\sqrt{x}$ over the interval $0 \le x \le 2$ is

A. $\frac{\sqrt{2}}{3}$ **B.** $\frac{\sqrt{2}}{2}$

C. $\frac{2\sqrt{2}}{3}$ **D.** $\frac{4\sqrt{2}}{3}$

7) Suppose $g'(x) < 0$ for all $x > 0$ and $F(x) = \int_0^x t\, g'(t)\,dt$ Which of the following statement is **FALSE**?

A. F takes on negative values **B.** $F(x) = x\,g(x) - \int_0^x g'(t)\,dt$

C. F is continuous for all $x > 0$ **D.** $F'(x)$ exists for all $x > 0$

E. F is an increasing function.

8) If $\frac{dy}{dx} = \cos 2x$, then $y =$

A. $-\frac{1}{2}\cos 2x + c$ **B.** $-\frac{1}{2}\sin 2x + c$

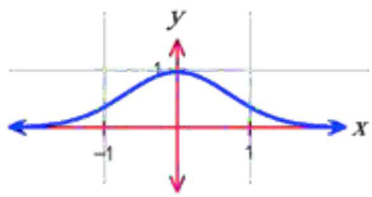
C. $\frac{1}{2}\sin 2x + c$ **D.** $\frac{1}{2}\sin^2 2x + c$

9) Which of the following is equal to ln 4

A. $\ln 3 + \ln 1$ **B.** $\ln 8 \div \ln 2$

C. $\int_1^4 e^t\,dt$ **D.** $\int_1^4 \frac{1}{t}\,dt$ **E.** $\int_1^4 \ln t\,dt$

10) If $\int_{-1}^{1} e^{-x^2}\,dx = k$ then $\int_{-1}^{0} e^{-x^2}\,dx =$



A. $\frac{1}{2}k$ **B.** $\frac{1}{2}k$

C. $-k$ **D.** $-2k$ **E.** $2k$

11) If $y = 10^{x^2-1}$, then $\frac{dy}{dx} =$

A. $10^{x^2-1}(2x)\ln 10$ **B.** $10^{x^2-1}(2x)$

C. $10^{x^2-1}(x^2-1)$ **D.** $10^{x^2-1}\ln 10$ **E.** $10^{x^2-1}(x^2)\ln 10$

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12) $\displaystyle\int_1^2 \frac{x^2-1}{x+1}\,dx =$

A. $\frac{1}{2}$ **B.** $\frac{5}{2}$

C. 1 **D.** 2 **E.** $\ln 3$

13) If $\displaystyle\int_{-2}^{2} (x^7+k)\,dx = 16$ then $k =$

A. 12 **B.** -12

C. 0 **D.** 4 **E.** -4

14) $\displaystyle\int_0^3 |x-1|\,dx =$

A. $\frac{3}{2}$ **B.** $\frac{5}{2}$

C. 0 **D.** 2 **E.** 6

15) $\displaystyle\int \tan 2x\,dx =$

A. $-2\ln|\cos 2x| + c$ **B.** $-\frac{1}{2}\ln|\cos 2x| + c$

C. $-2\ln|\cos 2x| + c$ **D.** $\frac{1}{2}\ln|\cos 2x| + c$

E. $-\frac{1}{2}\sec^2 2x + c$

16) $\displaystyle\int_0^{\frac{\pi}{3}} \sin 3x\,dx =$

A. $-\frac{2}{3}$ **B.** $\frac{2}{3}$

C. -2 **D.** 2 **E.** 0

17) Let f be a continuous function on the closed interval $[0, 2]$

if $2 \leq f(x) \leq 4$,then the greatest possible value of $\int_0^2 f(x)\, dx =$

A. 0 **B.** 2

C. 4 **D.** 8

18) The average value of $f(x) = x^2\sqrt{x^3+1}$ on the closed interval [0,2] is

A. $\frac{26}{9}$ **B.** $\frac{13}{3}$

C. $\frac{26}{3}$ **D.** 13

19) $\frac{d}{dx}\left[\ln\left(\frac{1}{1-x}\right)\right] =$

A. $\frac{1}{1-x}$ **B.** $\frac{1}{x-1}$

C. $x-1$ **D.** $1-x$

21) $\lim\limits_{h\to 0} \frac{\int_1^{1+h}\sqrt{x^5+8}\,dx}{h}$ is

A. 0 **B.** 1

C. 3 **D.** $2\sqrt{2}$

21) An antiderivative of $f(x) = e^{x+e^x}$ is

A. $\frac{e^{x+e^x}}{1+e^x}$ **B.** $(1+e^x)\, e^{x+e^x}$

C. e^{e^x} **D.** e^{x+e^x}

22) If the substitution $u = \frac{x}{2}$ is made, the integral $\int_2^4 \frac{1-\left(\frac{x}{2}\right)^2}{x}\,dx =$

A. $\int_1^2 \frac{1-u^2}{u}\,du$ **B.** $\int_2^4 \frac{1-u^2}{u}\,du$

C. $\int_1^2 \frac{1-u^2}{2u}\,du$ **D.** $\int_2^4 \frac{1-u^2}{2u}\,du$

23) A particle with velocity at any time t given by $v(t) = e^t$ moves in a straight line. How far does the particle move from $t = 0$ to $t = 2$?

A. $e^2 - 1$ **B.** $e - 1$

C. $2e$ **D.** e^2

24) The graph of $y = -\frac{5}{x-2}$ is concave downward for all values of x such that

A. $x < 0$ **B.** $x < 2$

C. $x > 2$ **D.** $x > 0$

25) $\int \frac{x\,dx}{\sqrt{3x^2+5}} =$

A. $\frac{1}{3}(3x^2+5)^{\frac{1}{2}} + c$ **B.** $\frac{1}{6}(3x^2+5)^{\frac{1}{2}} + c$

C. $\frac{1}{3}(3x^2+5)^{\frac{3}{2}} + c$ **D.** $\frac{3}{2}(3x^2+5)^{\frac{1}{2}} + c$

26) $\int_0^{\frac{\pi}{2}} \frac{\cos\theta}{\sqrt{1+\sin\theta}}\,d\theta =$

A. $-2(\sqrt{2}-1)$ **B.** $2\sqrt{2}$

C. $2(\sqrt{2}-1)$ **D.** $2(\sqrt{2}+1)$

27) If the function f has a continuous derivative on $[0, c]$,

then $\int_0^c f'(x)\,dx =$

A. $f(c) - f(0)$ **B.** $|f(c) - f(0)|$

C. $f''(c) - f''(0)$ **D.** $f(x) + c$

28) For all $x > 1$, if $f(x) = \int_1^x \frac{1}{t}\, dt$ Then $f(x) =$

A. 1 **B.** $\ln x$

C. $\frac{1}{x}$ **D.** e^x

29) For $x > 0$, $\int \left(\frac{1}{x} \int_1^x \frac{1}{t}\, dt \right) dx$

A. $\frac{1}{x^3} + c$ **B.** $\ln(\ln x) + c$

C. $\frac{(\ln x)^2}{2} + c$ **D.** $\frac{\ln(x^2)}{2} + c$

30) If $\int_1^{10} f(x)\, dx = 4$ and $\int_{10}^{3} f(x)\, dx = 7$ then $\int_1^3 f(x)\, dx$

A. -3 **B.** 0

C. 3 **D.** 11

31) If three equal subdivisions of $[-4, 2]$ are used, what is the trapezoidal approximation of $\int_{-4}^{2} \frac{e^{-x}}{2} dx$?

A. $\frac{1}{2}(e^4 + 2e^2 + 2e^0 + e^{-2})$ **B.** $e^4 + 2e^2 + 2e^0 + e^{-2}$

C. $\frac{1}{2}(e^4 + e^2 + e^0 + e^{-2})$ **D.** $e^4 + e^2 + e^0$

32) $\lim_{n\to\infty} \frac{1}{n}\left[\sqrt{\frac{1}{n}} + \sqrt{\frac{2}{n}} + \cdots + \sqrt{\frac{n}{n}}\right] =$

A. $\frac{1}{2}\int_0^1 \frac{1}{\sqrt{x}} dx$ **B.** $\int_0^1 \sqrt{x}\, dx$

C. $\int_1^2 x\sqrt{x}\, dx$ **D.** $\int_0^1 x\, dx$

33) If $\int_1^4 f(x)\,dx = 6$, what is the value of $\int_1^4 f(5-x)\,dx$?

A. 6 **B.** -6

C. -1 **D.** 3

34) The acceleration of a particle moving along the x-axis at time t is given by $a(t) = 6t^2 - 2$. If the velocity is 25 when $t = 3$ and the position is 10 when $t = 1$, then the position $x(t) =$

A. $9t^2 + 1$ **B.** $t^3 - t^2 + 4t + 6$

C. $3t^2 - 2t + 4$ **D.** $t^3 - t^2 + 9t - 20$

35) If f and g are continuous functions, and if $f(x) \geq 0$ for all real numbers x , which of the following **must** be true?

I. $\int_a^b f(x)\,g(x)\,dx = \left(\int_a^b f(x)\,dx\right)\left(\int_a^b g(x)\,dx\right)$

II. $\int_a^b \left(f(x) + g(x)\right)dx = \int_a^b f(x)\,dx + \int_a^b g(x)\,dx$

III. $\int_a^b \sqrt{f(x)}\,dx = \sqrt{\int_a^b f(x)\,dx}$

A. I only **B.** II only

C. III only **D.** II and III only

E. I, II and III

36) $\int_1^{500} (13^x - 11^x)\,dx + \int_2^{500} (11^x - 13^x)\,dx$

A. 14.946 **B.** 34.415

C. 46.000 **D.** 136.364

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37) $\frac{d}{dx}\int_0^x \cos(2\pi u)\ du\ \ is$

A. $\frac{1}{2\pi}\sin x$ **B.** $\cos 2\pi x$

C. $\frac{1}{2\pi}\cos 2\pi x$ **D.** $2\pi \cos 2\pi x$

38) If p is a polynomial of degree n, $n > 0$, what is the degree of the polynomial $Q(x) = \int_0^x p(t)\ dt$?

A. $n - 1$ **B.** n

C. $n + 1$ **D.** $n - 2$

39) A particle moves along the x-axis so that at any time $t \geq 0$ the acceleration of the particle is $a(t) = e^{-2t}$. If at $t = 0$ the velocity of the particle is $\frac{5}{2}$ and its position is $\frac{17}{4}$, then its position at any time $t > 0$ is $x(t) =$

A. $\frac{1}{4}e^{-2t} + 4$ **B.** $\frac{1}{2}e^{-2t} + 3t + \frac{15}{4}$

C. $\frac{1}{4}e^{-2t} + 3t + 4$ **D.** $4e^{-2t} + \frac{9}{2}t + \frac{1}{4}$

40) Let $f(x) = \int_{-2}^{x^2-3x} e^{t^2}\ dt$ at what value of x is $f(x)$ a minimum?

A. $\frac{1}{2}$ **B.** $\frac{3}{2}$

C. 2 **D.** 3

41) If f is continuous on the interval, $[a, b]$ then there exists c such that

$a < c < b$ and $\int_a^b f(x)\,dx =$

A. $\frac{f(a) - f(b)}{b-a}$ **B.** $(b - a)\,f'(c)$

C. $f(b) - f(b)$ **D.** $(b - a)f(c)$

42) If $\int_a^b f(x)\,dx = a + 2b$ then $\int_a^b (f(x) + 5)\,dx =$

A. $a + 2b + 5$ **B.** $5b - 5a$

C. $7b - 4a$ **D.** $7b - 5a$

43) $\int_0^{\frac{\pi}{4}} \frac{e^{\tan x}}{1 - \sin^2 x}\,dx$ is

A. $e + 1$ **B.** $e - 1$

C. e **D.** 1

44) The average value of $\cos x$ on the interval $[-3, 5]$ is

A. $\frac{\sin 5 - \sin 3}{8}$ **B.** $\frac{\sin 5 + \sin 3}{8}$

C. $\frac{\sin 5 - \sin 3}{2}$ **D.** $\frac{\sin 5 + \sin 3}{2}$

45) The expression $\frac{1}{50}\left(\sqrt{\frac{1}{50}} + \sqrt{\frac{2}{50}} + \sqrt{\frac{30}{50}} + \cdots + \sqrt{\frac{50}{50}}\right)$ is a Riemann sum approximation for:

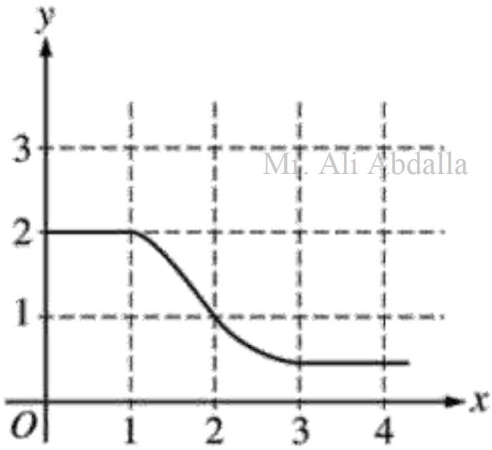
A. $\int_0^1 \sqrt{\frac{x}{50}}\,dx$ **B.** $\frac{1}{50}\int_0^1 \sqrt{x}\,dx$

C. $\int_0^1 \sqrt{x}\,dx$ **D.** $\int_0^{50} \sqrt{x}\,dx$

Remember

$$\int_a^b f(x)\,dx = \sum_{i=1}^{n} f(x_i)\,\Delta x$$

46) The graph of f is shown in the right figure. If $F'(x) = f(x)$ and $\int_1^3 f(x)\,dx = 2.3$ then $F(3) - F(0) =$



A. 4.3 **B.** 3.3

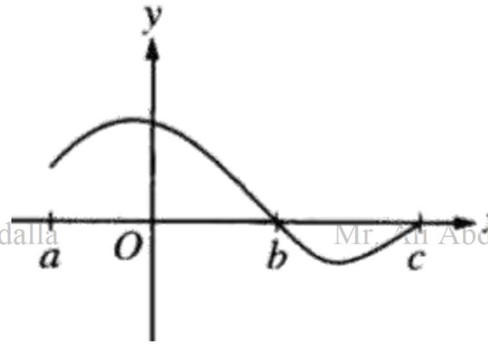
C. 0.3 **D.** 1.3

47) At time $t \geq 0$, the acceleration of a particle moving on the x-axis is $a(t) = t + \sin t$ at $t = 0$, the velocity of the particle is -2. For what value t will the velocity of the particle be zero?

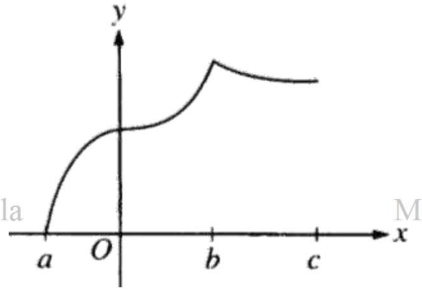
A. 1.02 **B.** 1.48

C. 1.85 **D.** 3.14

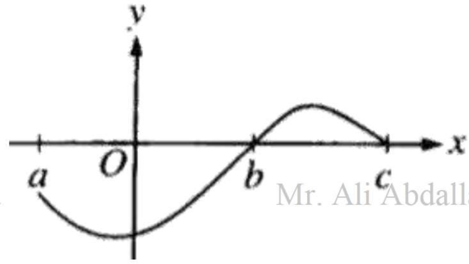
48) Let $f(x) = \int_a^x h(t)\,dt$, where h has the graph shown on the right. Which of the following could be the graph of f ?



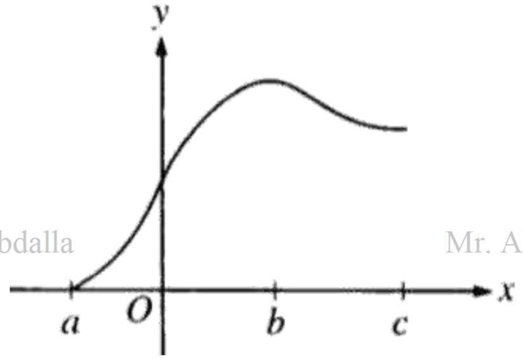
A.



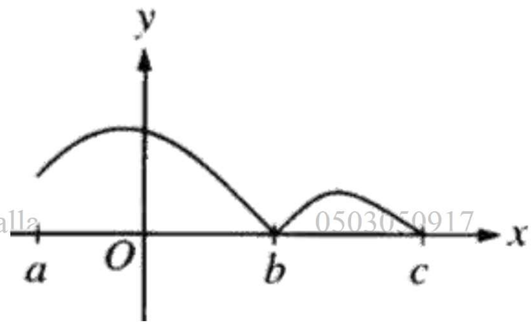
B.



C.



D.



49)

x	0	0.5	1.0	1.5	2.0
$f(x)$	3	3	5	8	13

A table of values for a continuous function f is shown above. If four equal subintervals of $[0, 2]$ are used, which of the following is the trapezoidal approximation of $\int_0^2 f(x)\,dx$

A. 8 **B.** 12 **C.** 16 **D.** 24

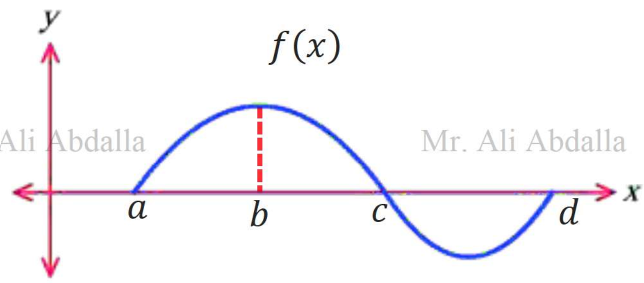
50) Which of the following are antiderivative of $f(x) = \sin x \cos x$?

I. $F(x) = \frac{\sin^2 x}{2}$ **II.** $F(x) = \frac{\cos^2 x}{2}$ **III.** $F(x) = -\frac{\cos 2x}{4}$

A. I only
B. II only
C. III only
D. I and III only
E. II and III only

51) The graph of $f(x)$ is shown in the right figure.

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.

52) Let g be a continuously differentiable function with $g(1) = 6$ and $g'(1) = 3$. What is $\lim_{x\to1} \frac{\int_1^x g(t)dt}{g(x) - 6}$?

A. 0
B. 1
C. 2
D. $\frac{1}{2}$
E. The limit does not exist.

53) If f is the antiderivative of $\frac{x^2}{1+x^5}$ such that $f(1) = 0$, then $f(4) =$

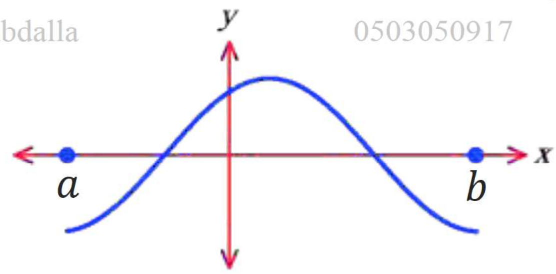
A. -0.012
B. 0.376
C. 0.016
D. 0.629

54) What are all values of k for which $\int_{-2}^{k} x^2\,dx = 0$

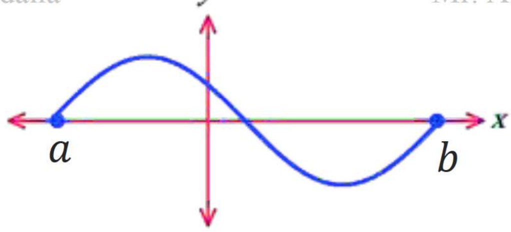
A. -2
B. -2 and 2
C. 2
D. 0

55) The graph of f is shown in the right figure.

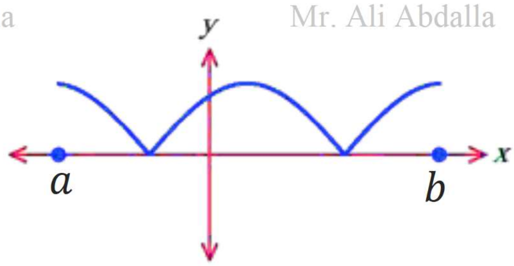
Which of the following could be the graph of the derivative of f ?



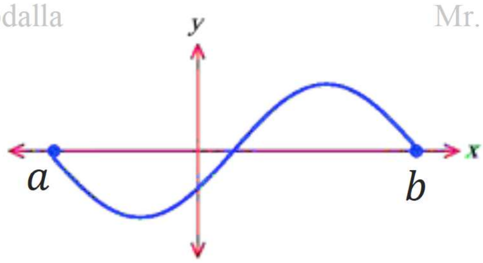
A.



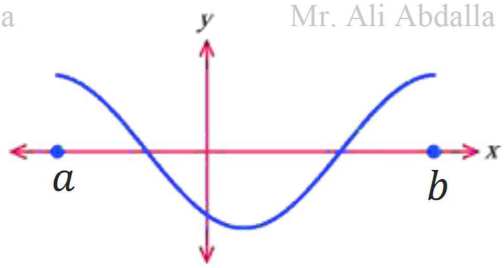
B.



C.



D.



56) $\lim\limits_{x\to 1} \dfrac{\int_1^x e^{t^2}\,dx}{x^2-1}$ is

A. 0 **B.** 1

C. $\frac{e}{2}$ **D.** e

57) The function $f(x)$ is continuous on the closed interval $[0,6]$ and has values that are given in the table below.

x	0	٢	٤	٦
$f(x)$	٤	k	٨	١٢

If three equal subintervals of $[0,6]$ are used, if $\int_0^6 f(x)\,dx$ by using the trapezoidal method $= 52$. Find the value of k

A. 6 **B.** 10

C. 7 **D.** 14

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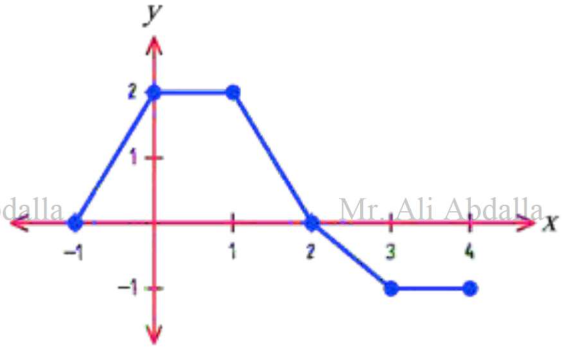
58) The graph of a piecewise-linear function f for $-1 \le x \le 4$, is shown on the right. What is the value of $\int_{-1}^{4} f(x)\,dx$?



A. 2.5

B. 4

C. 5.5

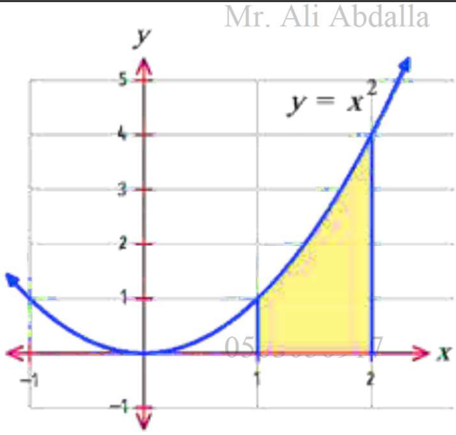
D. 8

59) If f is a continuous function and if $F'(x) = f(x)$ for all real numbers x, then $\int_{1}^{3} f(2x)\,dx =$

A. $2F(6) - 2F(2)$ **B.** $\frac{1}{2}F(6) - \frac{1}{2}F(2)$

C. $F(6) - F(2)$ **D.** $\frac{1}{2}F(3) - \frac{1}{2}F(1)$

60) Calculate the approximate area of the shaded region in the figure by the trapezoidal rule, using divisions at $x = \frac{4}{3}$ and $x = \frac{5}{3}$



A. $\frac{50}{27}$ **B.** $\frac{251}{108}$

C. $\frac{7}{3}$ **D.** $\frac{127}{54}$ **E.** $\frac{77}{27}$

61)

$t\ (sec)$	0	2	4	6
$a(t)\ \ (ft/sec^2)$	5	2	8	3

The data for the acceleration $a(t)$ of a car from 0 to 6 seconds are given in the table above. If the velocity at $t = 0$ is 11 feet per second, the approximate value of the velocity at $t = 6$, computed using a left-hand Riemann sum with three subintervals of equal length, is

A. 26 ft/sec **B.** 41 ft/sec **C.** 30 ft/sec **D.** 37 ft/sec

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62) If $f(x) = g(x) + 7$ for $3 \le x \le 5$, then $\int_3^5 [f(x) + g(x)]\, dx =$

A. $2\int_3^5 g(x)\, dx + 7$

B. $2\int_3^5 g(x)\, dx + 14$

C. $2\int_3^5 g(x)\, dx + 28$

D. $\int_3^5 g(x)\, dx + 7$

E. $\int_3^5 g(x)\, dx + 14$

63) If f is a linear function and $0 < a < b$, then $\int_a^b f''(x)\, dx =$

A. 0

B. $\frac{ab}{2}$

C. $b - a$

D. 1

E. $\frac{b^2 - a^2}{2}$

64) If $\frac{dy}{dx} = \sin x \cos^2 x$ and if $y = 0$ when $x = \frac{\pi}{2}$,
what the value of y when $x = 0$

A. $\frac{1}{3}$

B. 0

C. -1

D. $-\frac{1}{3}$

E. 1

65) Let $F(x)$ be an antiderivative of $\frac{(\ln x)^3}{x}$. If $F(1) = 0$, then $F(9) = \cdots$

A. 0.048

B. 5.827

C. 1640.250

D. 0.144

E. 23.308

66) If $f(x) = \int_0^x \frac{1}{\sqrt{t^3 + 1}}\, dt$ Which of the following is **FALSE**?

A. $f(0) = 0$

B. $f(1) > 0$

C. $f(-1) > 0$

D. $f'(1) = \frac{1}{\sqrt{2}}$

E. f is continuous at for all $x \ge 0$

67) If F and f are continuous functions such that $F'(x) = f(x)$ for all x, then $\int_a^b f(x)\,dx$ is

A. $F'(a) - F'(b)$
B. $F(b) - F(a)$
C. $F'(b) - F'(a)$
D. $F(a) - F(b)$
E. none of the above

68) $\int_0^1 (x+1)e^{x^2+2x}\,dx =$

A. $\frac{e^3}{2}$
B. $e^3 - e$
C. $\frac{e^3 - e}{2}$
D. $\frac{e^3 - 1}{2}$
E. $e^3 - 1$

69) Given $f(x) = \begin{cases} x+1, & x < 0 \\ \cos \pi x, & x \geq 0 \end{cases}$ Then $\int_{-1}^1 f(x)\,dx$

A. $\frac{1}{2} + \frac{1}{\pi}$
B. $\frac{1}{2}$
C. $-\frac{1}{2} + \pi$
D. $\frac{1}{2} - \frac{1}{\pi}$
E. $-\frac{1}{2}$

70) $\int_{-1}^2 \frac{|x|}{x}\,dx$ *is*

A. -3
B. 2
C. 3
D. 1
E. non-existent

71) If n is a known positive integer, for what value of k is: $\int_1^k x^{n-1}\,dx = \frac{1}{n}$

A. 0
B. $\left(\frac{2n-1}{n}\right)^{\frac{1}{n}}$
C. 2^n
D. $2^{\frac{1}{n}}$
E. $\left(\frac{2}{n}\right)^{\frac{1}{n}}$

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72) If $\int_{1}^{2} f(x-c)\ dx = 5$ Where c is a constant, then $\int_{1-c}^{2-c} f(x)\ dx =$

A. $5+c$

B. 5

C. $5-c$

D. $c-5$

E. -5

73) For $f(x) = x + \int_{0}^{\tan x} \frac{1}{1+t^2} dt$ then $f'(x) =$

A. 2

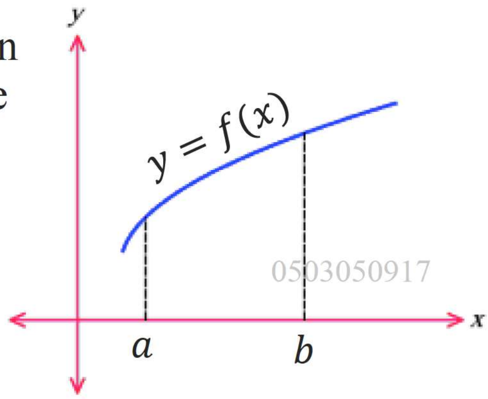
B. $1+\sec^2 x$

C. $1+\frac{\sec^2 x}{1+\tan x}$

D. $1+\frac{1}{1+\tan^2 x}$

E. 0

74) If f is the continuous, strictly increasing function on the interval $a \le x \le b$ as shown on the right, which of the following must be true?



I. $\int_{a}^{b} f(x)\,dx < f(b)(b-a)$

II. $\int_{a}^{b} f(x)\,dx > f(a)(b-a)$

III. $\int_{a}^{b} f(x)\,dx = f(c)(b-a)$ For some numbers c such that $a < c < b$

A. I only

B. II only

C. III only

D. I and II only

E. I, II and III

75) If $f(x) = \int_{2x}^{\sin x} \cos t^3 \, dt$, then $f'(x)$ is equal to

A. $\cos(\sin^3 x)\cos x - 2\cos 8x^3$

B. $\sin(\sin^3 x)\sin x - 2\sin 8x^3$

C. $\cos(\cos^3 x)\cos x - 2\cos x^3$

D. $\cos(\sin^3 x)\cos x - \cos 8x^3$

76) Let f be a differentiable function for all real numbers x, and

$f(1) = 4$ then the value of $\lim_{x\to 1} \frac{\int_4^{f(x)} 2t\,dt}{x-1}$ If $f'(1) = 2$ is

A. 16

B. 8

C. 4

D. 2

77) $\int 2\sin^2 x \, dx =$

B. $2x - \frac{1}{2}\cos 2x + c$

C. $2x - \frac{1}{2}\cos 2x + c$

D. $x - \frac{1}{2}\cos 2x + c$

78) $\int \frac{e^{\sec^2 x}}{e^{\tan^2 x}} \, dx$

A. $x + c$

B. $e\,x + c$

C. $e^x + c$

D. $e + c$

79) A sensor measures the position $f(t)$ of a particle t microseconds after a collision as given in the table. Estimate the position of the particle at $t = 8$

x	5	10	15
$f(x)$	8	14	18

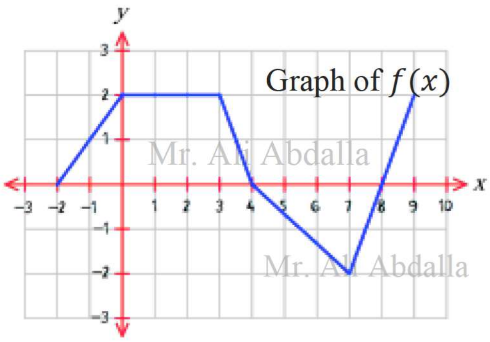
A. 11.2

B. 11.6

C. 16.2

D. 13.1

80) Let g be the function given by $g(x) = \int_{-2}^{2} f(t)\,dt$ The graph of the function $f(x)$, shown on the right, consists of five lines segment, which of the following intervals the function $g(x)$ is decreasing



A. $(-2, 4)$

B. $(3, 7)$

C. $(4, 8)$

D. $(3, 4)$

81) $$\int \frac{e^{3\ln 2x} + 5e^{2\ln 2x}}{e^{4\ln x} + 5e^{3\ln x} - 7e^{2\ln x}}\,dx$$

A. $8\ln|x^2 + 5x - 7| + c$

B. $4\ln|x^2 + 5x - 7| + c$

C. $8\ln|x^2 + 10x - 7| + c$

D. $4\ln|x^2 + 10x - 7| + c$

82) $$\int \frac{x}{(x-1)(x+1)}\,dx$$

A. $\ln|x^2 - 1| + c$

B. $2\ln|x^2 - 1| + c$

C. $\ln|x - 1| - x\ln|x + 1| + c$

D. $\ln|x - 1| + c$

83) $\int \cot x \, dx$

A. $\ln|\sin x| + c$

B. $-\ln|\cos x| + c$

C. $-\csc^2 x + c$

D. $\ln|\sec x| + c$

84) $\int \frac{x}{\sqrt{1-x^2}} \, dx$

A. $-\sqrt{1-x^2} + c$

B. $-\frac{1}{2}\sqrt{1-x^2} + c$

C. $\sqrt{1-x^2} + c$

D. $\frac{1}{2}(1-x)^{3/2} + c$

85) $\int \frac{e^x}{e^{2x}+1} dx$

A. $\ln|e^{2x} + 1| + c$

B. $\tan^{-1}(e^x) + c$

C. $\tan^{-1}(e^{2x}) + c$

D. $\ln|e^x + 1| + c$

86) $\int \frac{\sin^2 x}{1-\cos x} dx$

A. $x + \sin x + c$

B. $x + \cos x + c$

C. $x - \sin x + c$

D. $1 + \sin x + c$

87) $\int \frac{x^3 + 4x}{x^4 + 1}\,dx$

A. $\frac{1}{4}\ln|x^4+1| + 2\tan^{-1} 2x + c$

B. $\ln|x^4+1| + 2\tan^{-1} 2x + c$

C. $\frac{1}{4}\ln|x^4+1| - 2\tan^{-1} 2x + c$

D. $4\ln|x^4+1| + 2\tan^{-1} 2x + c$

88) Find the function $f(x)$ satisfying the given conditions:
$f''(x) = 12x^2 + 2e^x$, $f'(0) = 2$, $f(0) = 3$

A. $x^4 + 2e^x + 1$

B. $x^4 - 2e^x + 1$

C. $x^4 + 2e^x + 5$

D. $8x^4 + 6e^x + 1$

89) Find a function $f(x)$ such that the point $(1,2)$ is on the graph of $y = f(x)$, the slope of the tangent line at $(1,2)$ is 3 and $f''(x) = x - 1$

A. $\frac{1}{6}x^3 - \frac{1}{2}x^2 + \frac{7}{2}x - \frac{7}{6}$

B. $\frac{1}{6}x^3 + \frac{1}{2}x^2 + \frac{7}{2}x + \frac{7}{6}$

C. $x^3 - \frac{1}{2}x^2 + \frac{7}{2}x - 7$

D. $x^3 - x^2 + x - 7$

90) $\int e^{x^2 + \ln x}\,dx$

A. $e^{x^2} + c$

B. $2e^{x^2} + c$

C. $\frac{1}{2}e^{x^2} + c$

D. $\frac{1}{2}x^2 + c$

91) $\sum_{i=1}^{100} (i^2 - 3i + 2) =$

A. 323000

B. 323400

C. 300400

D. 323200

92) $\lim_{n\to\infty} \left(\sum_{i=1}^{n} \frac{2}{n} \left(\frac{i}{n} + 2 \right) \right)$

A. 5

B. 50

C. 500

D. 5000

93) Use the given function values to estimate the area under the curve of $f(x)$ using left-endpoint evaluation.

x	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
$f(x)$	1.8	1.4	1.1	0.7	1.2	1.4	1.8	2.4	2.6

A. $\frac{50}{59}$

B. $\frac{59}{50}$

C. $\frac{63}{50}$

D. $\frac{50}{63}$

94) If $f(x) = 3x^2$ Find a value of c that satisfies the conclusion of the Integral Mean Value Theorem on the interval $[0, 2]$

A. $\frac{2}{3}$

B. $\frac{2}{\sqrt{3}}$

C. $-\frac{2}{\sqrt{3}}$

D. $\pm\frac{2}{\sqrt{3}}$

95) The value of $\int_0^1 3x^2\sqrt{1+x^2}\,dx$ Is between

A. $\frac{3}{2}$ and 2

B. 0 and $\sqrt{3}$

C. 1 and $\sqrt{2}$

D. $\frac{1}{2}$ and $\frac{4}{3}$

$0 \le x \le 1$

$0 \le x^2 \le 1$

$1 \le 1+x^2 \le 2$

$1 \le \sqrt{1+x^2} \le \sqrt{2}$

$3x^2 \le 3x^2\sqrt{1+x^2} \le 3\sqrt{2}\,x^2$

$\int_0^1 3x^2\,dx \le \int_0^1 3x^2\sqrt{1+x^2}\,dx \le \int_0^1 3\sqrt{2}\,x^2\,dx$

$x^3\Big|_0^1 \le \int_0^1 3x^2\sqrt{1+x^2}\,dx \le \sqrt{2}\,x^3\Big|_0^1$

$1 \le \int_0^1 3x^2\sqrt{1+x^2}\,dx \le \sqrt{2}$

Or: $m(b-a) \le \int_0^1 3x^2\sqrt{1+x^2}\,dx \le M(b-a)$

$0(1-0) \le \int_0^1 3x^2\sqrt{1+x^2}\,dx \le 3\sqrt{2}(1-0)$

$0 \le \int_0^1 3x^2\sqrt{1+x^2}\,dx \le 3\sqrt{2}$

96) If $f(x) = \int_0^x (t^2 - 3t + 2)\,dt$ Which of the following is true?

A. f has local maximum at $x = 2$ and local minimum at $x = 1$

B. f has local maximum at $x = 1$ and local minimum at $x = 2$

C. f has no local maximum and local minimum at $x = 2$

D. f has no local minimum and maximum local at $x = 1$

97) If $\int_0^x f(t)\,dt = x(\ln x - 1)$ What is the value of $f(e^2)$?

A. $2 - \ln 2$

B. $\ln 2$

C. e^2

D. 2

98) If $f(x) = \int_{\cos x}^{\sin x} \sqrt{1-t^2}\,dt$ Where $0 \le x \le \frac{\pi}{2}$ then $f'(x) =$

A. $2\sin x$

B. $\sin^2 x$

C. $\sin^2 x - \cos^2 x$

D. 1

99) By using the table in the right **Find** $h'(2)$ if

$$h(x) = \int_{2}^{g(x)} f(t)\,dt$$

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
0	2	1	10	−2
1	−5	−8	5	1
2	15	−1	1	3

A. -5

B. 3

C. -15

D. 15

100) The area between $y = \sin x$ and the x-axis for $\frac{\pi}{4} \le x \le \frac{\pi}{2}$ is

A. $\frac{\sqrt{3}}{3}$

B. $\sqrt{2}$

C. $\frac{\sqrt{2}}{2}$

D. $\frac{2\sqrt{3}}{3}$

101) The area above the x-axis and below $y = 4x - x^2$

A. $\frac{32}{3}$

B. $\frac{16}{3}$

C. $\frac{32}{9}$

D. $\frac{16}{5}$

102) $\int \frac{\sqrt{1 - 2\tan x}}{\cos^2 x}\,dx =$

A. $-\frac{1}{3}(1 - 2\tan x)^{\frac{3}{2}} + c$

B. $\frac{1}{3}(1 - 2\tan x)^{\frac{3}{2}} + c$

C. $-3(1 - 2\tan x)^{\frac{3}{2}} + c$

D. $-\frac{1}{3}(1 - 2\tan x)^{\frac{1}{2}} + c$

103) $\int \frac{1}{\sqrt{1+\sqrt{x}}}\,dx =$

A. $\frac{4}{3}(1+\sqrt{x})^{\frac{3}{2}} - 4\sqrt{1+\sqrt{x}} + c$

B. $\frac{3}{2}(1+\sqrt{x})^{\frac{3}{2}} - 2\sqrt{1+\sqrt{x}} + c$

C. $(1+\sqrt{x})^{\frac{3}{2}} - 4\sqrt{1+\sqrt{x}} + c$

D. $\frac{4}{3}(1+\sqrt{x})^{\frac{3}{2}} + 4\sqrt{1+\sqrt{x}} + c$

104) $\int \frac{(1+\sin x)^5}{\sec x}\,dx =$

A. $6(1+\sin x)^6 + c$

B. $\frac{1}{6}(1+\sin x)^6 + c$

C. $\frac{1}{6}\cos^6 x + c$

D. $\frac{1}{6} + \frac{1}{6}\sin^6 x + c$

105) If $\int_1^2 f(x)\,dx = 4$ Then $\int_1^4 \frac{f(\sqrt{x})}{\sqrt{x}}\,dx =$

A. 4

B. 6

C. 8

D. 10

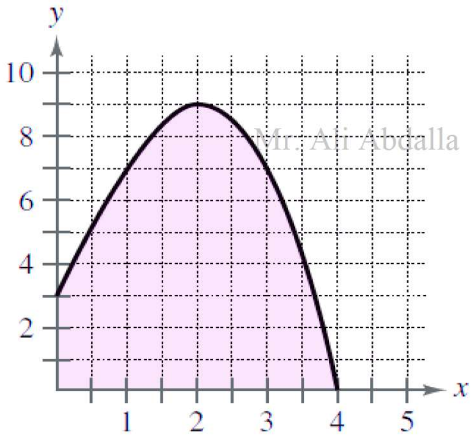
106) Use the graph to estimate shaded area $\left(\int_0^2 f(x)\,dx\right)$ by using Simpson's Rule with $n = 4$

A. $\frac{77}{3}$

B. $\frac{77}{2}$

C. 77

D. $\frac{77}{6}$



107) Determine the number of steps that will guarantee an accuracy of at least 10^{-7} for using each of Simpson's Rule to approximate $\int_1^4 \frac{1}{x}\,dx$

A. 135

B. 136

C. 137

D. 134

108) Determine the number of steps that will guarantee an accuracy of at least 10^{-7} for using each of Trapezoidal Rule to approximate $\int_1^4 \frac{1}{x}\,dx$

A. 6708

B. 6709

C. 135

D. 136

109) Use Trapezoidal Rule to estimate $\int_0^2 f(x)\,dx$ from the given data:

x	0.0	0.50	1.00	1.50	2.00
$f(x)$	4.0	5.2	5.0	4.4	4.0

A. $\frac{31}{5}$

B. $\frac{93}{10}$

C. $\frac{93}{5}$

D. $\frac{186}{5}$

110) Use Simpson's Rule with $n = 4$ to estimate $\ln 5$

A. $\frac{73}{45}$

B. $\frac{73}{30}$

C. $\frac{3}{2}$

D. $\frac{73}{15}$

111) $\int \frac{xe^x}{(1+x)^2}\,dx =$

A. $\frac{e^x}{1+x} + c$

B. $\frac{e^x}{(1+x)^2} + c$

C. $e^x \ln|1+x| + c$

D. $\frac{e^x}{2(1+x)} + c$

112) If $\int \frac{1+\cos 4x}{\cot x - \tan x}\,dx = k\cos 4x + c$ then $k =$

Challenge

A. $-\frac{1}{4}$

B. $-\frac{1}{2}$

C. $\frac{1}{4}$

D. $-\frac{1}{8}$

113) If $\int \frac{4x^3 + a\,4^x}{4^x + x^4}\,dx = \ln|x^4 + 4^x| + c$ then $a =$

A. $\ln 4$

B. $\log_4 e$

C. 1

D. 4

114) If $\int \frac{\sqrt{\cot x}}{\sin x \cos x}\,dx = a\sqrt{\cot x} + c$ then $a =$

A. -1

B. 1

C. -2

D. 2

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115) $\int \frac{10x^9 + 10^x \log_e 10}{10^x + x^{10}}\, dx =$

A. $10^x + x^{10}$

B. $10^x - x^{10}$

C. $\log_e(10^x + x^{10})$

D. $\frac{1}{10^x + x^{10}}$

116) If $\int_0^x f(t)\, dt = x + \int_x^1 t\, f(t)\, dt$, then $f(1) =$

A. $\frac{1}{2}$

B. 0

C. 1

D. $-\frac{1}{2}$

117) $\int_0^{\frac{\pi}{3}} \frac{\cos x + \sin x}{\sqrt{1 + \sin 2x}}\, dx =$

A. $\frac{\pi}{3}$

B. $\frac{2\pi}{3}$

C. $\frac{4\pi}{3}$

D. π

118) If $f(x) = \begin{cases} x^2, & x < 0 \\ -1, & x = 0 \\ x, & x > 0 \end{cases}$, then $\int_{-1}^{1} f(x)\, dx =$

A. $\frac{5}{6}$

B. $\frac{2}{3}$

C. $-\frac{1}{6}$

D. nonexistent

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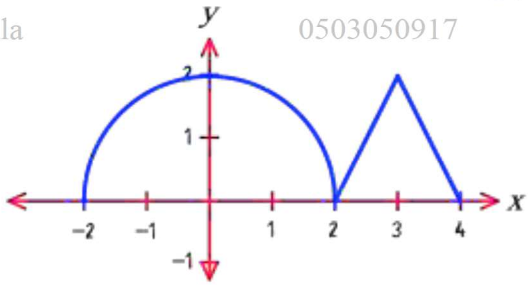
119) The graph of g′ , the first derivative of the function g, consists of a semicircle of radius 2 and two line segments, as shown in the right figure. If $g(0) = 1$, what is the value of g(3)?



A. $\pi + 1$ **C.** $2\pi + 1$

B. $\pi + 2$ **D.** $2\pi + 2$

120) Let g be a twice differentiable, increasing function of t .If $g(0) = 20$ and $g(10) = 220$,which of the following must be true on the interval $0 < t < 10$?

A. $g'(t) = 0$ for some t in the interval.

B. $g'(t) = 20$ for some t in the interval.

C. $g''(t) = 0$ for some t in the interval.

D. $g''(t) = 0$ for some t in the interval.

121) If $\displaystyle\int_1^{x^3} \frac{1}{1 + \ln t}\,dt$ For $x > 1$ then $f'(2) =$

A. $\dfrac{1}{1+\ln 2}$ **C.** $\dfrac{1}{1+\ln 8}$

B. $\dfrac{12}{1+\ln 2}$ **D.** $\dfrac{12}{1+\ln 8}$

122) Which of the following limits is equal to $\displaystyle\int_3^5 x^4\,dx$?

A. $\displaystyle\lim_{n\to\infty}\sum_{i=1}^{n}\left(3+\frac{i}{n}\right)^4\left(\frac{1}{n}\right)$

B. $\displaystyle\lim_{n\to\infty}\sum_{i=1}^{n}\left(3+\frac{i}{n}\right)^4\left(\frac{2}{n}\right)$

C. $\displaystyle\lim_{n\to\infty}\sum_{i=1}^{n}\left(3+\frac{2i}{n}\right)^4\left(\frac{1}{n}\right)$

D. $\displaystyle\lim_{n\to\infty}\sum_{i=1}^{n}\left(3+\frac{2i}{n}\right)^4\left(\frac{2}{n}\right)$

123) If $\dfrac{d}{dx}\left(\int_e^{x^3} \ln(t^2+1)\,dt\right) =$

A. $\ln(x^6+1)$

B. $2x^2\ln(x^6+1)$

C. $2x^2\ln(x^2+1)$

D. $\ln(x^6+1) - \ln(e^6+1)$

124) Using the substitution $u = 1 + x$ then $\displaystyle\int \frac{x}{\sqrt{1+x}}\,dx$ is equivalent to

A. $\displaystyle\int \frac{1}{u+1}\,du$

B. $\displaystyle\int u^{-\frac{1}{2}}\,du$

C. $\displaystyle\int \left(u^{\frac{1}{2}} - u^{-\frac{1}{2}}\right) du$

D. $\displaystyle(u-1)\int u^{-\frac{1}{2}}\,du$

125) $\displaystyle\lim_{x\to 2} \frac{x^2-4}{\int_2^x \cos \pi t\,dt}$ *is*

A. 0

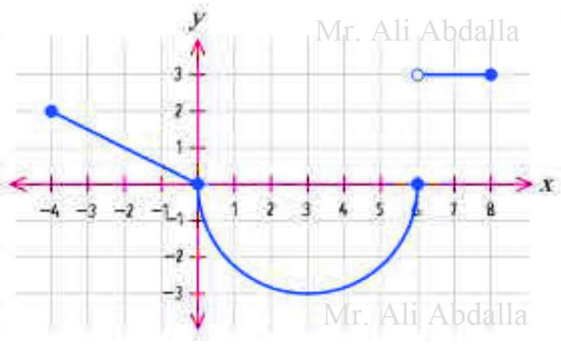
B. 2

C. 4

D. non-existent

126) The function g is defined on the closed interval $[-4, 8]$. The graph of g consists of two linear pieces and a semicircle, as shown in the right figure. Let f be the function defined by:

$$f(x) = 3x + \int_0^x g(t)\, dt$$



Graph of $g(x)$

Find the value of $f(7)$ and $f'(7)$

A. $f(7) = 24 - \frac{9\pi}{2}$, $f'(7) = 6$

B. $f(7) = 24 + \frac{9\pi}{2}$, $f'(7) = 6$

C. $f(7) = 24 - \frac{9\pi}{2}$, $f'(7) = 9$

D. $f(7) = 21 - \frac{9\pi}{2}$, $f'(7) = 9$

127) $\lim_{x \to -2} \frac{f(x) + 7}{e^{3x+6} - 1}$

Use information in question 126

A. $\frac{4}{3}$

B. ∞

C. $-\frac{5}{3}$

D. $-\frac{4}{3}$

x	0	1	2	3	4	5	6
$f(x)$	0	0.25	0.48	0.68	0.84	0.95	1

128) For the function whose value are given in the table above, $\int_0^6 f(x)\, dx$ is approximated by a Riemann sum using the value at the midpoint of each of three intervals of width 2. The approximation is

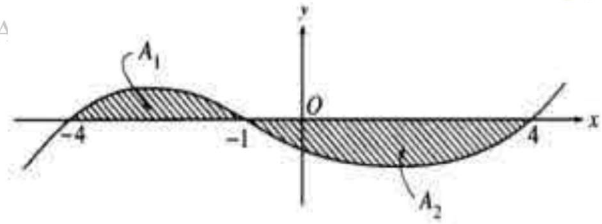
A. 2.64

B. 3.64

C. 3.76

D. 4.64

129) The graph of $y = f(x)$ is shown in the right figure. 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. $A_1 - A_2$ **B.** $A_1 + A_2$

C. $A_1 - 3A_2$ **D.** $A_1 + 2A_2$

130) If $\int_a^b f(x)\,dx = 5$ and $\int_a^b g(x)\,dx = -1$ Which of the following must be true?

I. $f(x) > g(x)$ for $a \le x \le b$

II. $\int_a^b (f(x) + g(x))\,dx = 4$

III. $\int_a^b (f(x)\,g(x))\,dx = -5$

A. I only **B.** II only

C. III only **D.** II and III only

E. I, II and III

131) Find the area under the curve $f(x) = 3x^2$ on $[0, 1]$, $n = 4$ using Simpson's rule

A. 0.8

B. 1

C. 6

D. 12

132) If $G(x)$ is an antiderivative for $f(x)$ and $G(2) = -7$ then $G(4) =$

A. $f'(4) - 7$

B. $\int_2^4 (f(x) - 7)\, dt$

C. $-7 + \int_2^4 f(x)\, dt$

D. $f'(4)$

133) The function f is continuous and $\int_0^8 f(u)\; du = 6$ What is the value of $\int_1^3 x\, f(x^2 - 1)\; dx$?

A. $\frac{3}{2}$

B. 3

C. 6

D. 12

134) Approximate the area under the curve $y = x^2 + 2$ from $x = 1$ to $x = 2$ using four midpoint rectangles.

A. 4.333

B. 4.328

C. 4.719

D. 4.344

135) If the substitution $u = \sqrt{x}$ is made, the integral $\int_1^4 \frac{e^{\sqrt{x}}}{\sqrt{x}} dx =$

A. $2\int_1^{16} e^u\, du$

B. $2\int_1^4 e^u\, du$

C. $\frac{1}{2}\int_1^2 e^u\, du$

D. $2\int_1^2 e^u\, du$

136) The function f is defined by $f(x) = \begin{cases} 2 & ,x < 3 \\ x - 1 & ,x \geq 3 \end{cases}$

What is the value of $\int_1^5 f(x)\,dx =$

A. 2 B. 8

C. 6 D. 10

137) Let f be a function such that $g'(x) = \int_6^{12} f(2x)\,dx = 10$

Which of the following must be true?

A. $\int_{12}^{24} f(u)\,du = 5$ C. $\int_6^{12} f(u)\,du = 5$

B. $\int_{12}^{24} f(u)\,du = 20$ D. $\int_6^{12} f(u)\,du = 20$

E. $\int_3^6 f(u)\,du = 5$

138) If $\int_0^x f\left(\frac{x}{c}\right) dx =$

A. $\frac{1}{c}\int_a^b f(x)\,dx$ C. $c\int_a^b f(x)\,dx$

B. $\int_a^b f(x)\,dx$ D. $\int_{ac^2}^{bc^2} f(x)\,dx$

139) Let $f(x) = \int_1^x \sqrt{2 - t^2}\,dt$, then the real roots of the equation $x^2 - f'(x) = 0$ are

A. ± 1 C. $\pm\frac{1}{\sqrt{2}}$

B. $\pm\frac{1}{2}$ D. $0, -1$ and 1

140) $\int \left(2\sqrt{x}\cos x + \frac{1}{\sqrt{x}}\sin x\right)\, dx =$ ... ...

A. $2\sqrt{x}\cos x + C$

B. $2\sqrt{x}\sin x + C$

C. $\sqrt{x}\cos x + C$

D. $\sqrt{x}\sin x + C$

141) $\lim_{n\to\infty}\sum_{i=1}^{n} 3\left(c_i^2 - 3\right)\Delta x$ on the interval $[1, 2]$ equivalent to

A. $\int_1^2 (3x^2 - 9)dx$

B. $\int_1^2 (3x^2 - 6)dx$

C. $\int_1^2 (3x^2)dx$

D. $\int_1^2 (3x^2 + 9)dx$

142) Let $\int_a^2 f(x)\, dx = 12$, and the average value of $f(x)$ on the interval $[a, 2]$ is 4. Find the value of a?

A. -1

B. 0

C. 1

D. 2

143) If $f'(x) = e^{-x}$ and $f(0) = 3$ then $f(x) =$

A. $2 - e^{-x}$

B. $4 - e^{-x}$

C. $4 + e^{-x}$

D. $2 + e^{-x}$

144) $\frac{d}{dx}\left(\ln\sqrt{x^2+1}\right) =$ … … … … …

A. $\frac{2x}{x^2+1}$

B. $2x$

C. $\frac{x}{x^2+1}$

D. x^2+1

145) $\frac{d}{dx}\int_2^x \sqrt{1+t^2}\, dt$

A. $\frac{x}{\sqrt{1+x^2}}$

B. $\sqrt{1+x^2}$

C. $\sqrt{1+x^2}-5$

D. $\frac{x}{\sqrt{1+x^2}}-\frac{1}{\sqrt{5}}$

146) Which of the following gives the bounded of $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} 3\cos x^2\; dx$

A. $-1 \le \int_{\frac{\pi}{3}}^{\frac{\pi}{2}} 3\cos x^2\; dx \le 0.5$

B. $-1.23 \le \int_{\frac{\pi}{3}}^{\frac{\pi}{2}} 3\cos x^2\; dx \le 0.72$

C. $-1.23 \le \int_{\frac{\pi}{3}}^{\frac{\pi}{2}} 3\cos x^2\; dx \le 1$

D. $-1.23 \le \int_{\frac{\pi}{3}}^{\frac{\pi}{2}} 3\cos x^2\; dx \le 0.5$

147) $\int_0^1 \sqrt{x^2-2x+1}\;\; dx =$ … … …

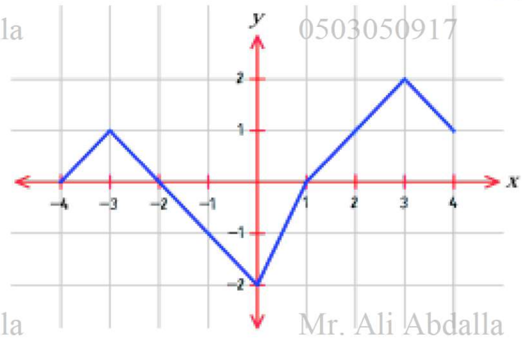
A. $-\frac{1}{2}$

B. -1

C. $\frac{1}{2}$

D. 1

148) If $f(x)$ is continuous on $-4 \leq x \leq 4$ and the graph of $f(x)$ consist of five lines segment as shown in the right figure find the average value of $f(x)$ on the average on $[-4, 4]$



A. $\frac{1}{8}$

B. $\frac{3}{16}$

C. $\frac{5}{16}$

D. $\frac{3}{2}$

149) By using Reimann Sum which of the following represent the following integral: $\int_3^5 x^4 \, dx$

A. $\lim_{n\to\infty} \sum_{i=1}^{n} \left(3 + \frac{i}{n}\right)^4 \frac{1}{n}$

B. $\lim_{n\to\infty} \sum_{i=1}^{n} \left(3 + \frac{i}{n}\right)^4 \frac{2}{n}$

C. $\lim_{n\to\infty} \sum_{i=1}^{n} \left(3 + \frac{2i}{n}\right)^4 \frac{1}{n}$

D. $\lim_{n\to\infty} \sum_{i=1}^{n} \left(3 + \frac{2i}{n}\right)^4 \frac{2}{n}$

150) $\int 3e^{2\ln x} \, dx =$

A. $x^3 + c$

B. $3e^{2x} + c$

C. $\frac{3}{x} + c$

D. $\ln x^3 + c$

151)

x	-4	-3	-2	-1	0	1	2	3	4
$g'(x)$	2	3	0	-3	-2	-1	0	3	2

The derivative g′ of a function g is continuous and lies exactly two zeros. Selected value of g′ are given in the table above.
If the domain of g is the set of all real numbers, then g is decreasing on which of the following intervals?

A. $-2 \le x \le 2$ only

B. $-1 \le x \le 1$ only

C. $x \ge -2$

D. $x \ge 2$ only

E. $x \le -2$ only $x \ge 2$

152) Let f and g be continuous functions such that $\int_0^{10} f(x)\,dx = 21$, $\int_0^{10} \frac{1}{2}\, g(x)\,dx = 8$ *and* $\int_3^{10} (f(x) - g(x))\,dx = 2$

What is the value of $\int_0^{3} (f(x) - g(x))\,dx$

A. 3
B. 7
C. 11
D. 15

تم بحمد الله

سُبْحَانَكَ اللَّهُمَّ وَبِحَمْدِكَ، أَشْهَدُ أَنْ لا إِلَهَ

إِلا أَنْتَ، أَسْتَغْفِرُكَ وَأَتُوبُ إِلَيْكَ

2021/2022

Answers keys

Q#	Answer	Q#	Answer	Q#	Answer	Q#	Answer
1	B	2	B	3	A	4	C
5	C	6	C	7	E	8	C
9	D	10	B	11	A	12	A
13	D	14	B	15	B	16	B
17	D	18	A	19	A	20	C
21	C	22	A	23	A	24	C
25	A	26	C	27	A	28	B
29	C	30	D	31	A	32	B
33	A	34	B	35	B	36	A
37	D	38	C	39	C	40	B
41	D	42	C	43	B	44	B
45	C	46	A	47	B	48	C
49	B	50	D	51	C	52	C
53	B	54	A	55	A	56	A
57	B	58	A	59	B	60	D
61	B	62	B	63	A	64	D
65	B	66	C	67	B	68	D
69	B	70	D	71	D	72	B
73	A	74	E	75	A	76	A
77	A	78	C	79	B	80	A
81	A	82	A	83	B	84	A
85	A	86	A	87	A	88	C
89	B	90	A	91	B	92	A
93	C	94	B	95	D	96	D
97	C	98	C	99	A	100	A
101	A	102	B	103	C	104	A
105	B	106	B	107	B	108	A
109	A	110	D	111	B	112	C
113	C	114	A	115	A	116	A
117	B	118	B	119	D	120	D
121	B	122	C	123	C	124	A
125	A	126	C	127	B	128	B
129	B	130	C	131	B	132	B
133	D	134	D	135	B	136	C
137	A	138	B	139	A	140	C
141	A	142	C	143	B	144	B
145	C	146	B	147	D	148	A
149	A	150	A	151	A	152	A
153		154		155		156	
157		158		159		160	

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