Name_____ Date_____ Gelatin Brand_____

AP Calculus Test 4.1-4.3, No calculator

Multiple Choice

_____ 1. $\int\left(x^2-2\right)^2\,dx=$

(A) $\left(\frac{x^3}{3}-2x\right)^2+C$ (B) $\frac{x^5}{5}-\frac{4x^3}{3}+4x+C$ (C) $\frac{\left(x^2-2\right)^3}{6x}+C$ (D) $\frac{2x}{3}\left(x^2-2\right)^3+C$ (E) $\left(\frac{x^2-2}{3}\right)^3+C$

_____ 2. If $f'(x)=\frac{x+1}{\sqrt{x}}$ and $f(1)=0$, then $f(4)=$

(A) $\frac{20}{3}$ (B) $\frac{4}{3}$ (C) $-\frac{4}{3}$ (D) $-\frac{8}{3}$ (E) $\frac{3}{4}$

_____ 3. $\int\frac{\sin 2x}{\cos x}\,dx=$

(A) $\cos x+C$ (B) $2\cos x+C$ (C) $-2\cos x+C$ (D) $-\cos 2x+C$ (E) $\cos 2x+C$

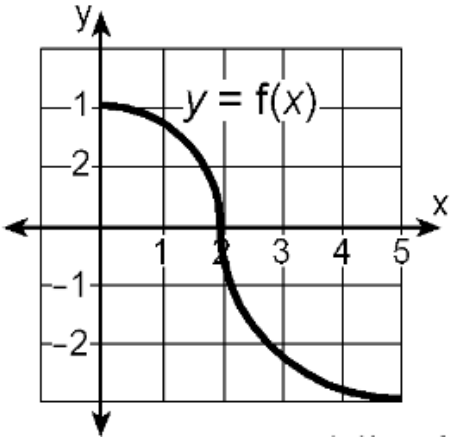
_____ 4. $\int\csc x\left(\cot x+\sin x\right)dx=$

(A) $-\csc x+C$ (B) $-\csc x+x+C$ (C) $\sec x+\cos x+C$ (D) $\csc x+x+C$ (E) $-\sec x+\tan x+C$

_____ 5. $\int_0^4\left|3x-2\right|dx=$

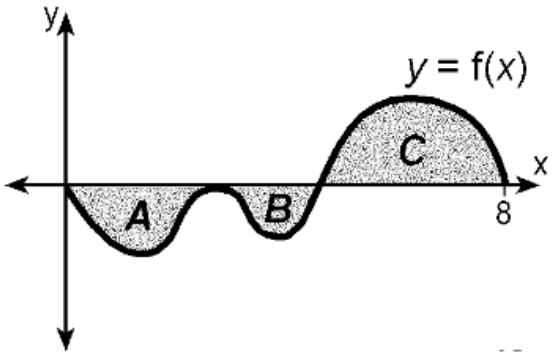
(A) $\frac{33}{2}$ (B) $\frac{50}{3}$ (C) $\frac{35}{2}$ (D) $\frac{52}{3}$ (E) $\frac{47}{3}$

_____ 6. If the graph of the function $f(x)$ below is composed of two quarter circles, then $\int_5^0 f(x)\,dx =$



(A) $\frac{13\pi}{4}$ (B) $\frac{5\pi}{4}$ (C) $-\frac{5\pi}{4}$ (D) $\frac{13\pi}{2}$ (E) 13π

_____ 7. In the graph below, the areas of regions A, B, and C are $A = 3.2$, $B = 1.6$, and $C = 4.4$.



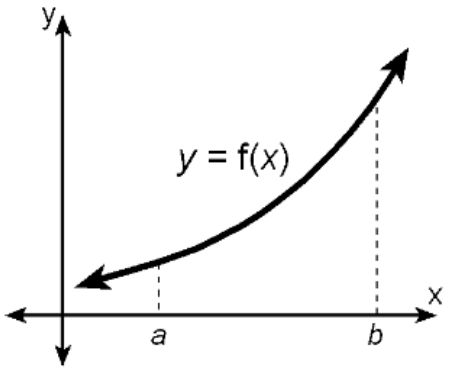
What is the value of $\int_0^8 \big(f(x) - 2\big)\,dx$?

(A) 16.4 (B) −0.4 (C) −15.6 (D) −16.4 (E) −2.4

_____ 8. $\int_0^{\pi/4} 4\sec^2 x\,dx =$

(A) 4π (B) 0 (C) 4 (D) π (E) 8

_____ 9. According to the graph below, which of the following is **false** for the function $f(x)$ when the indicated Riemann & Trapezoidal sums are used to approximate the value of $\int_a^b f(x)dx$?



(A) Right hand sum ≥ Midpoint sum
(B) Midpoint sum ≤ Trapezoidal sum
(C) Left hand sum ≥ Trapezoidal sum
(D) Left hand sum ≤ Right hand sum
(E) Trapezoidal sum ≤ Right hand sum

_____ 10. The table below gives various values of a continuous function $f(x)$ on the closed interval $[0,8]$.

x	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
$f(x)$	0.8	1.2	3.1	0.6	0.4	2.2	3.0	2.4	3.6

Using the given values and four subintervals of width 2, the midpoint Riemann approximation of $\int_0^8 f(x)dx$ is

(A) 12.4 (B) 11.8 (C) 12.8 (D) 12.6 (E) 13.2

_____11. The table of values below represents a continuous function $g(x)$.

x	1	3	4	7	9
$g(x)$	20	40	60	50	70

Using 3 subintervals, what is the trapezoidal approximation of $\int_1^7 g(x)dx =$

(A) 135 (B) 305 (C) 270 (D) 275 (E) 290

_____ 12. If $\int_{-2}^3 f(x)dx = 5$, $\int_6^3 f(x)dx = -4$, and $\int_6^5 f(x)dx = 2$, what is $\int_5^{-2} f(x)dx$?

(A) -11 (B) -7 (C) -1 (D) 1 (E) 3

Short Answer: Evaluate the following indefinite integrals. Remember, rewriting is the key, and don't forget your $+C$.

13. $\int\left(5^x+\frac{4-x}{x}\right)dx=$

14. $\int\left(\frac{\sqrt{1-t^2}\cdot\sqrt[3]{t^2}+1}{\sqrt{1-t^2}}\right)dt=$

15. $\int 4\sqrt{m}\,(2m-5)^2\,dm=$

16. $\int\left(\cot^2 x-\sec^2 x\right)dx=$