

Name _____

Date _____

1. $\int (6x - 5)e^{3x^2 - 5x + 4} dx =$

- a) $e^{3x^2 + 2x} + C$
 b) $e^{3x^2 - 5x + 4} + C$
 c) $xe^{3x^2 - 5x + 4} + C$
 d) $e^{6x - 5} + C$
 e) $(3x^2 - 5x + 4)e^{3x^2 - 5x + 4} + C$

2. $\int \frac{\ln(5x)}{x} dx =$

- a) $\frac{1}{5} \ln 5x - x + C$ b) $\frac{1}{2} (\ln 5x)^2 + C$
 c) $2x \ln 5x - x + C$ d) $\frac{1}{5} \ln \frac{1}{5} x + C$
 e) $5x \ln 5x + C$

3. If $\frac{dy}{dx} = \frac{3}{4x \ln x}$, then $y =$

- a) $3 \ln 4x + C$ b) $4 \ln 3x^x + C$
 c) $4x \ln 3x + C$ d) $\frac{3}{4} e^{\ln x} + C$
 e) $\frac{3}{4} \ln(\ln x) + C$

4. $\int \frac{\ln x}{2x} dx =$

- a) $\frac{(\ln x)^2}{4} + C$ b) $\frac{\ln x}{4} + C$ c) $\frac{x \ln x}{2} + C$
 d) $x \ln x + C$ e) $\sqrt{x} \ln x + C$

5. $\int 19e^{-t/5} dt =$

- a) $-95e^{-t/5} + C$ b) $-\frac{19}{5}e^{-t/5} + C$
 c) $\frac{19}{10}e^{-t^2/5} + C$ d) $-190e^{-t^2/5} + C$
 e) $-\frac{10}{19}e^{-t^2/5} + C$

6. $\int \frac{1}{1 - e^{-3x}} dx =$

- a) $\frac{1}{3} \ln |e^{3x} - 1| + C$ b) $\ln |1 - e^{-3x}| + C$
 c) $\frac{1}{3} e^{-3x} + C$ d) $e^x \ln |1 - e^{-3x}| + C$
 e) $\ln |1 + e^{-3x}| + C$

AP Calculus

Prequiz Integration of Exponential and Logarithmic Functions

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7. Evaluate: $\int \frac{5e^x}{e^x + 1} dx$

- a) $\frac{1}{5}e^{\ln(x+1)} + C$ b) $5e^{\ln(x+1)} + C$
 c) $5 \ln(e^x + 5) + C$ d) $5 \ln(e^x + 1) + C$
 e) $\ln(e^x + 5) + C$

8. Evaluate the indefinite integral: $\int \frac{1}{x^2 e^{2/x}} dx$

- a) $\frac{1}{2}xe^{-2/x} + C$ b) $\frac{1}{2}xe^{2/x} + C$
 c) $\frac{1}{2}e^{2/x} + C$ d) $\frac{1}{2}e^{-2/x} + C$
 e) $-\frac{1}{3x^3 e^{3/x}} + C$

9. Use a calculator to determine $\int_0^3 2e^{-3x^2} dx$.

- a) 1.023 b) 1.574 c) 1.989 d) 2.084 e) 0.845

10. A story is being heard at a rate of $R(t) = 400e^{-0.21t}$ people per week. Approximately how many people will hear the story during the seventh and eighth week?

11. Evaluate: $\int_2^{e+1} \frac{1}{x-1} dx$

- a) 1 b) $1 - \frac{1}{e^2}$ c) -1
 d) $2 - e - \ln 2$ e) $\frac{1}{e} - 1$

12. Find the average value of $f(x) = 0.4e^{-2x^2}$ on the closed interval $[-1, 1]$.

- a) 0.239 b) 0.139 c) 0.478 d) 0.119 e) 0.821

13. A sly red fox, initially at rest, with position $s(0) = 0$, moves along a straight hunting path. At any time $t \geq 0$, its acceleration is $a(t) = e^{t/2}$, with $v(0) = 6$. How far does the fox travel from $t = 0$ to $t = 4$?

- a) 12 b) $3e^2 + 9$ c) $4e^2 + 12$
 d) $4e^2 + 20$ e) 24

14. A roadrunner moves in a straight line at any time t with velocity $v(t) = 2e^t$. How far does it move from $t = 0$ to $t = 3$?

- a) $2e^3 - 1$ b) $2(e^3 - 1)$ c) $e^3 - 2$
 d) $2 \ln e + e$ e) $e^2 - 2$

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15. Given $\int_0^2 e^{x^2} dx = K$. Find $\int_{-2}^2 e^{-x^2} dx$.

- a) $\frac{K}{2}$ b) $\frac{K}{4}$ c) K d) $2K$ e) K^2

16. Given $\int_{-1}^1 e^{-x^2} dx = K$. Find $\int_0^1 e^{-x^2} dx$.

- a) $\frac{K}{2}$ b) $\frac{K}{4}$ c) K d) $2K$ e) K^2

17. If $f(x) = x^2 e^x$ find a point where the tangent is horizontal.

- a) $(0, 1)$ b) $(0, e^2)$ c) $(-2, \frac{4}{e^2})$
 d) $(0, -2)$ e) $(-2, 4e^2)$

18. Find the slope of the tangent line to the graph of $y = (\ln x)e^{3x}$ at the point where $x = 1$.

- a) $\frac{1}{3}e^3$ b) $3e^3$ c) e d) $3e$ e) e^3

19. Which of the following functions are continuous for all real numbers x ?

I. $y = 3(x - 2)^2$

II. $y = \sqrt{x^2 - 2x^3}$

III. $y = 4 \ln 5x$

- a) I only b) II only
 c) I and II only d) I and III only
 e) I, II, and III

20. $\lim_{x \rightarrow \infty} \frac{e^{2x}}{\ln 7x}$ is

- a) 1 b) 0 c) $\frac{2}{7}$ d) $5e$ e) ∞

1.
Answer: b
CodePath: EAS.APC.F.E.30
2.
Answer: b
CodePath: EAS.APC.F.E.34
3.
Answer: e
CodePath: EAS.APC.F.E.37
4.
Answer: a
CodePath: EAS.APC.F.E.39
5.
Answer: a
CodePath: EAS.APC.F.E.47
6.
Answer: a
CodePath: EAS.APC.F.E.52
7.
Answer: d
CodePath: EAS.APC.F.E.53
8.
Answer: d
CodePath: EAS.APC.F.E.57
9.
Answer: a
CodePath: EAS.APC.F.H.31
10.
Answer: 185
CodePath: EAS.APC.F.G.42
11.
Answer: a
CodePath: EAS.APC.F.D.71
12.
Answer: a
CodePath: EAS.APC.G.A.28
13.
Answer: c
CodePath: EAS.APC.G.C.40
14.
Answer: b
CodePath: EAS.APC.G.C.39

15.
Answer: d
CodePath: EAS.APC.G.B.20
16.
Answer: a
CodePath: EAS.APC.G.B.19
17.
Answer: c
CodePath: EAS.APC.E.C.21
18.
Answer: e
CodePath: EAS.APC.E.C.48
19.
Answer: a
CodePath: EAS.APC.C.F.10
20.
Answer: e
CodePath: EAS.APC.C.E.20