AP Calculus BC

Chapter 5 Review

Name _____ Date _____

1. Find $\frac{d}{dx}\int_1^x (4c^3+7c+2)dc =$

a) $4x^3+7x+2$ b) $4c^2+7c+2$
c) $4x^2+7c+2$ d) $8x+7$
e) $8c+7$

2. $\frac{d}{dx}\int_x^3 (3t^2-11t)dt =$

a) $6t-11$ b) $3x^2-11x$ c) $11x-3x^2$
d) -7 e) $3t^2-11t$

3. $\frac{d}{dx}\int_5^{x^3} \frac{dt}{t-7} =$

a) $\frac{1}{x-7}$ b) $\frac{3x^2}{x-7}$ c) $-\frac{3x^2}{x^3-7}$
d) $\frac{3x^2}{x^3-7}$ e) $\frac{x^3}{x^3-7}$

4. $\frac{d}{dx}\int_2^{\cos x} (2-t^2)dt =$

a) $-(2-2\cos x)\sin x$ b) $-(2-t^2)\sin x$
c) $(2-\cos^2 x)$ d) $-(2-\cos^2 x)\sin x$
e) $(2-\cos^2 x)\sin x$

5. If $F(x) = \int_1^{5x+3} f(t)dt$ and $f(13) = 4$, then $F'(2) =$

a) 65 b) 20 c) 13 d) -13 e) -65

6. If $F'(x) = f(x)$ for all x, and if f is a continuous function, then $\int_2^7 f(3x)\,dx =$

a) $\frac{1}{3}(F(7)-F(2))$ b) $\frac{1}{3}(F(21)-F(6))$
c) $F(21)-F(6)$ d) $3(F(7)-F(2))$
e) $3(F(21)-F(6))$

7. If $y = e^{x^2-3x}$, then $y' =$

a) $(2x-3)e^{x^2-3x}$ b) e^{x^2-3x}
c) $2x-3$ d) $(x^2-3x)e^{x^2-3x}$
e) $(2x-3)e^{2x-3}$

8. If $y = e^{1/x}$, then $y' =$

a) $-\frac{e^{1/x}}{x^2}$ b) $e^{1/x}$ c) $\ln\left(\frac{1}{x}\right)$
d) $\frac{e^{1/x}}{x}$ e) $xe^{1/x}$

9. If $y = e^{\cos x}$, then $\frac{dy}{dx} =$

a) $-e^{\cos x}\sin x$ b) $e^{\cos x \sin x}$
c) $e^{\cos x}$ d) $e^x \sin x$
e) $e^x \cos x \sin x$

10. A curve is defined by $y = e^{\sin 2x}$. Find $\frac{dy}{dx}$.

a) $e^{\sin 2x}\cos 2x$ b) $2e^{\sin 2x}\cos 2x$
c) $\sin 2x \cos 2x$ d) $\sin 2x e^{\cos 2x}$
e) $4\sin 4x$

11. $\frac{d}{dx}e^{\ln 5x} =$

a) 5^x b) $5^x(\ln 5)$ c) $e^x(\ln 5)$
d) $5^x(\ln 5 + e)$ e) 5

12. Given $f(x) = e^{\ln(x^2+3)}$, find $f'(x)$.

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

13. If $y = \ln(x^2-x)$, then $\frac{dy}{dx} =$

a) $\frac{2x-1}{x(x-1)}$ b) $\frac{2x}{x(x-1)}$ c) $\frac{2}{x}$
d) $\frac{1}{x(x-1)}$ e) $\frac{x(x-1)}{2x-1}$

14. If $y = \ln(e^{3x}-5)$, then $\frac{dy}{dx} =$

a) $\frac{1}{e^{3x}-5}$ b) $\frac{1}{e^{3x}}$ c) $\frac{3x-5}{e^{3x}-5}$
d) $\frac{3e^{3x}}{e^{3x}-5}$ e) $e^{3x}-5$

15. Find $\frac{dy}{dx}$ given $y = \ln(5-x)^6$.

a) $\frac{1}{(5-x)^6}$ b) $\frac{6}{x-5}$ c) $-6(5-x)^5$

d) $6(5-x)^5$ e) $-\frac{1}{5-x}$

16. Find the derivative of $f(x) = \ln(x^3+3x)^3$.

a) $\frac{9(x^2+1)}{x(x^2+3)}$ b) $\frac{3(x^2+1)}{x^3+3x}$

c) $\frac{3(x^2+1)}{x(x^3+3x)}$ d) $\frac{9(x^2+1)}{x(x^3+3x)}$

e) $\frac{1}{9(x^2+1)(x^3+3x)^2}$

17. Find $\frac{dy}{dx}$ for $y = \ln\sqrt{x^2+4}$.

a) $\frac{x}{\sqrt{x^2+4}}$ b) $\frac{2x}{\sqrt{x^2+4}}$ c) $\frac{x}{x^2+4}$

d) $\frac{1}{x}$ e) $e^x \cdot e^{x^2+4}$

18. If $f(x) = \ln(\sin(3x-8))$, then $f'(x) =$

a) $\frac{\cos(3x-8)}{\sin(3x-8)}$ b) $\cos(\ln(3x-8))$

c) $3\cos(3x-8)$ d) $3\ln(\cos(3x-8))$

e) $3\cot(3x-8)$

19. Find the derivative of $f(x) = \ln\frac{x(x^2+2)}{\sqrt{x^3-7}}$.

a) $\frac{x^2+2}{x} + \frac{2x^2}{x^2+2} + \frac{3x^2}{2(x^3-7)}$

b) $\frac{1}{x} + \frac{2x}{x^2+2} - \frac{3x^2}{2(x^3-7)}$

c) $\frac{x^2+2}{x} + \frac{2x^2}{x^2+2} - \frac{3x^2}{2(x^3-7)}$

d) $\frac{1}{x} + \frac{2x}{x^2+2} + \frac{3x^2}{2(x^3-7)}$

e) $\frac{1}{x} - \frac{2x}{x^2+2} + \frac{3x^2}{2(x^3-7)}$

20. Find the derivative of $f(x) = \ln\frac{\sqrt{x^2+1}}{x(2x^3-1)^2}$.

a) $\frac{x}{x^2+1} - \frac{1}{x} + \frac{12x^2}{2x^3-1}$

b) $\frac{x}{x^2+1} - \frac{1}{x} + \frac{6x^2}{2x^3-1}$

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

d) $\frac{x}{x^2+1} - \frac{1}{x} - \frac{12x^2}{2x^3-1}$

e) $\frac{2x}{x^2+1} - \frac{1}{x} + \frac{6x^2}{x^3-1}$

21. Find $\frac{dy}{dx}$ for $y = 5^x$.

a) $x\ln 5$ b) $5x\ln 5$ c) $5\ln x$

d) $5^x\ln 5$ e) $5^x\ln x$

22. Given $y = 5^{-x}$, then $\frac{dy}{dx} =$

a) $5^{-2x}\ln 5$ b) $5^{-2x}2\ln 5$ c) $5^{-x}2\ln 5$

d) $5^{-x}x\ln 5$ e) $-(5^{-x})\ln 5$

23. If $y = 3^{2x^2-5x}$, then $\frac{dy}{dx} =$

a) $4x - 5(3^{2x^2-5x})$

b) $(2x^2-5x)(3^{2x^2-5x-1})$

c) $4x(3^{2x^2-5x})\ln 3$

d) $(4x-5)e^3(3^{2x^2-5x})$

e) $(4x-5)(3^{2x^2-5x})\ln 3$

24. Find $\frac{dy}{dx}$ given $y = 3^x x^3$.

a) $3^x x^2[3+(\ln 3)x]$ b) $2x^2 3^{x-1}$

c) $3^{x-1}x^2[9+x^2]$ d) $9x^2$

e) $3x^2[3-x\ln 3]$

25. Find y' given $xe^y + 1 = xy$.

a) 0 b) $\frac{y-e^y}{xe^y-x}$ c) $\frac{y}{e^y-x}$

d) $\frac{e^y}{xe^y-1}$ e) $\ln x$

26. Given $f(x) = 3^{2x}$, find $f'(0)$

a) $\ln 3$ b) $\ln 9$ c) $3\ln 3$
d) $6\ln 3$ e) $\ln 6$

27. Given $f(x) = e^{\sqrt{2x}}$, find $f'(2)$.

a) e^2 b) $2e$ c) $\dfrac{e^2}{4}$ d) $\dfrac{1}{e}$ e) $\dfrac{e^2}{2}$

28. Find an equation of the tangent line to the curve $y = \ln(x-3)$ at the point where the curve intersects the x-axis.

a) $y = x+4$ b) $y = x-4$ c) $y = x-3$
d) $y = x+3$ e) $y = 3x$

29. Suppose $f(x) = x^7$ and let $h(x)$ be the inverse of f. Find $h'(128)$.

a) $\frac{1}{448}$ b) $-\frac{1}{448}$ c) 448
d) $\frac{1}{64}$ e) $-\frac{1}{64}$

30. Given $y = \arccos(5x)$, then $\dfrac{dy}{dx} =$

a) $\dfrac{5}{\sqrt{1-25x^2}}$ b) $\dfrac{1}{\sqrt{1-25x^2}}$
c) $\dfrac{-5}{\sqrt{1-25x^2}}$ d) $\dfrac{9}{\sqrt{1-5x^2}}$
e) $\dfrac{5}{\sqrt{1-\cos(5x)}}$

31. Given $y = \arcsin(5x)$, then $\dfrac{dy}{dx} =$

a) $\dfrac{5}{\sqrt{1-5x^2}}$ b) $\dfrac{5}{\sqrt{1-25x^2}}$
c) $\dfrac{5}{\sqrt{1-\sin(5x)}}$ d) $\dfrac{-5}{\sqrt{1+25x^2}}$
e) $\dfrac{-5}{\sqrt{1-x^2}}$

32. Differentiate: $f(x) = \tan^{-1}\left(\dfrac{x}{3}\right)$

a) $\dfrac{3}{x^2+9}$ b) $\dfrac{3}{x^2-9}$ c) $-\dfrac{3}{x^2-9}$
d) $-\dfrac{3}{x^2+9}$ e) $\dfrac{1}{3}$

33. The functions f and g are differentiable and have the values shown in the table.

If $A = f^{-1}$ then $A'(4) =$

a) $-\dfrac{1}{4}$ b) 12
c) 3 d) $\dfrac{1}{12}$
e) $\dfrac{1}{3}$

x	f	f'	g	g'
2	4	3	8	6
4	10	12	6	9
6	16	26	4	18
8	30	40	2	24

34. $\displaystyle\int \tan 3x\, dx =$

a) $-\frac{1}{3}\ln|\cos 3x| + C$ b) $\frac{1}{3}\ln|\cos 3x| + C$
c) $\frac{1}{3}\sec^2 3x$ d) $\ln|\cos 3x| + C$
e) $3\ln|\cos 3x| + C$

35. $\displaystyle\int \sec 2x\, dx =$

a) $\frac{1}{2}\ln|\sec 2x + \tan 2x| + C$
b) $\frac{1}{4}\sec^2 2x + C$
c) $2\csc 2x + C$
d) $\frac{1}{4}\csc 2x + C$
e) $\frac{1}{2}\ln|\tan 2x| + C$

36. $\displaystyle\int \sin^3(3x)\cos(3x)\, dx =$

a) $\frac{1}{8}\sin^4(3x)\cos^2(3x) + C$
b) $\frac{1}{4}\sin^4(3x) + C$
c) $3\sin^2(3x)\left(3\cos^2(3x) - \sin^2(3x)\right) + C$
d) $\frac{1}{12}\sin^4(3x) + C$
e) $\frac{1}{48}\sin^4(3x)\cos^2(3x) + C$

37. $\displaystyle\int \frac{\sin(\ln x)}{x}\, dx =$

a) $\sin(\ln x) + C$ b) $\cos(\ln x) + C$
c) $\tan(\ln x) + C$ d) $-\cos(\ln x) + C$
e) $-\sin(\ln x) + C$

38. $\int (10x+2)e^{5x^2+2x-3}\,dx =$

a) $e^{5x^2+2x}+C$

b) $e^{5x^2+2x-3}+C$

c) $xe^{5x^2+2x-3}+C$

d) $e^{10x+2}+C$

e) $(5x^2+2x-3)e^{5x^2+2x-3}+C$

39. $\int \frac{6x+5}{3x^2+5x-2}\,dx =$

a) $\frac{1}{3}\ln\left|3x^2+5x-2\right|+C$

b) $\ln\left|3x^2+5x-2\right|+C$

c) $\arctan(3x^2+5x-2)+C$

d) $\arcsin(3x^2+5x-2)+C$

e) $6x\ln(3x^2+5x-2)+C$

40. $\int \frac{\ln 7x}{x}dx =$

a) $\frac{1}{7}\ln 7x - x + C$

b) $\frac{1}{2}(\ln 7x)^2 + C$

c) $2x\ln 7x - x + C$

d) $\frac{1}{7}\ln\frac{1}{7}x + C$

e) $7x\ln 7x + C$

41. $\int 10^x\,dx =$

a) $10^x + C$

b) $\ln 10 + C$

c) $\frac{10^x}{\ln 10} + C$

d) $\frac{e^x}{\ln 10} + C$

e) $10\frac{10^x}{\ln 10} + C$

42. Evaluate: $\int e^{7x}dx =$

a) $7e^{\frac{1}{7}x}+C$

b) $\frac{1}{7}e^{\frac{1}{7}x}+C$

c) $\frac{1}{7}e^{7x}+C$

d) $7e^{7x}+C$

e) $e^{7x}+C$

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

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) $-\frac{10}{19}e^{-t^2/5}+C$

44. 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) $\ln(e^x+5)+C$

45. $\int \frac{2e^x}{(e^x+1)^2}\,dx =$

a) $-\frac{2}{e^x+1}+C$

b) $-\frac{2}{(e^x+1)^2}+C$

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

d) $\frac{1}{(e^x+1)}+C$

e) $\frac{1}{2(e^x+1)}+C$

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

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) $-\frac{1}{3x^3e^{3/x}}+C$

47. Integrate: $\int 3\csc x\cot x\,dx$

a) $-3\csc x+C$

b) $-3\csc^2 x+C$

c) $\frac{3}{2}\csc^2 x\cot x+C$

d) $-\frac{3}{4}\csc^2 x\cot^2 x+C$

e) $3\sin x\tan x+C$

48. Integrate: $\int 3\csc^2 x\,dx$

a) $\frac{1}{2}\csc^3 x+C$

b) $6\csc^2 x\cot x+C$

c) $-3\cot x+C$

d) $-\frac{1}{3}\csc^3 x+C$

e) $\csc^3 x+C$

49. Evaluate $\int \frac{dx}{3+x^2}$

a) $\frac{\sqrt{3}}{3}\arctan\frac{x\sqrt{3}}{3}+C$

b) $3\arctan x+C$

c) $\arctan\frac{x}{x}+C$

d) $\arcsin\frac{x\sqrt{3}}{3}+C$

e) $\arccos\frac{x\sqrt{3}}{3}+C$

50. Evaluate: $\displaystyle\int \frac{5}{x^2+6x+13}\,dx$

a) $5\ln\left|x^2+6x+13\right|+C$

b) $5\left(\dfrac{x^3}{3}+3x^2+13x\right)+C$

c) $\dfrac{5}{2}\tan^{-1}\left(\dfrac{x+3}{2}\right)+C$

d) $-\dfrac{5}{x}+\dfrac{5}{6}\ln|x|+\dfrac{5}{13}x+C$

e) $\dfrac{15}{x^3}+\dfrac{5}{3x^2}+\dfrac{5}{13x}+C$

51. $\displaystyle\int \frac{12dx}{\sqrt{16-x^2}}=$

a) $\sin^{-1}\dfrac{x}{4}+C$

b) $\dfrac{1}{2}\sin^{-1}\dfrac{x}{4}+C$

c) $2\sin^{-1}\dfrac{x}{4}+C$

d) $4\sin^{-1}\dfrac{x}{4}+C$

e) $12\sin^{-1}\dfrac{x}{4}+C$

52. $\displaystyle\int \frac{dx}{\sqrt{9-4x^2}}=$

a) $\arcsin\dfrac{2x}{3}+C$

b) $\dfrac{1}{2}\arcsin\dfrac{2x}{3}+C$

c) $\dfrac{1}{2}\arctan\dfrac{2x}{3}+C$

d) $\dfrac{1}{2}\arctan\dfrac{x}{3}+C$

e) $\dfrac{1}{4}\arcsin\dfrac{2x}{3}+C$

AP Calculus BC Chapter 5 Review Gilliland 12/4/2014

Answer List

1.	a	2.	c	3.	d
4.	d	5.	b	6.	b
7.	a	8.	a	9.	a
10.	b	11.	e	12.	a
13.	a	14.	d	15.	b
16.	a	17.	c	18.	e
19.	b	20.	d	21.	d
22.	e	23.	e	24.	a
25.	b	26.	b	27.	e
28.	b	29.	a	30.	c
31.	b	32.	a	33.	e
34.	a	35.	a	36.	d
37.	d	38.	b	39.	b
40.	b	41.	c	42.	c
43.	a	44.	d	45.	a
46.	d	47.	a	48.	c
49.	a	50.	c	51.	e
52.	b				

Catalog List

1.	APC FI 1	2.	APC FI 13	3.	APC FI 19
4.	APC FI 22	5.	APC FI 37	6.	APC FI 49
7.	APC DN 1	8.	APC DN 3	9.	APC DN 5
10.	APC DN 7	11.	APC DN 15	12.	APC DN 19
13.	APC DN 21	14.	APC DN 25	15.	APC DN 27
16.	APC DN 29	17.	APC DN 31	18.	APC DN 35
19.	APC DN 37	20.	APC DN 39	21.	APC DN 43
22.	APC DN 46	23.	APC DN 48	24.	APC DN 53
25.	APC DN 55	26.	APC EB 43	27.	APC EB 47
28.	APC EC 42	29.	APC EE 3	30.	APC EE 18
31.	APC EE 19	32.	APC EE 25	33.	APC DB 31
34.	APC FE 11	35.	APC FE 13	36.	APC FE 15
37.	APC FE 25	38.	APC FE 29	39.	APC FE 31
40.	APC FE 33	41.	APC FE 41	42.	APC FE 45
43.	APC FE 47	44.	APC FE 53	45.	APC FE 55
46.	APC FE 57	47.	APC FF 10	48.	APC FF 21
49.	APC FF 23	50.	APC FF 29	51.	APC FF 37
52.	APC FF 43				