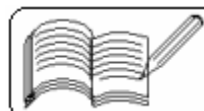(Answers at the end of all problems)

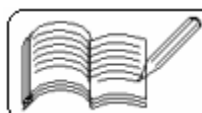Integrate the following functions with respect to x:

(1) $\dfrac{x^4 + x^2 + 1}{x^2 + 1}$

(2) $\dfrac{x^6 + 2}{x^2 + 1}$

(3) $\dfrac{x^4}{x^2 + 1}$

(4) $\left[\left(\log \dfrac{1}{2}\right)^2 - x^2\right]^{-\frac{1}{2}}$

(5) $\dfrac{\sin x}{1 - \sin x}$

(6) $\dfrac{e^{2x} - 1}{e^{2x} + 1}$

(7) $\dfrac{1}{\cos^2 x \, \sin^2 x}$

(8) $\dfrac{1}{a^2 \cos^2 x + b^2 \sin^2 x}$

(9) $\dfrac{1}{1 + \tan x}$

(10) $\dfrac{1}{x \sqrt{1 - x^3}}$

(11) $\dfrac{x^2 - 1}{x^4 + 1}$

(12) $\dfrac{\sin x \cos x}{3 \sin^2 x - 4 \cos^2 x}$

(13) $\sqrt{1 + \cos 2x}$ $(\pi/2 < x < \pi)$

(14) $\dfrac{x \tan^{-1} x^2}{1 + x^4}$

(15) $\dfrac{\sin x}{\sqrt{1 + \sin x}}$ $(0 < x < \pi)$

(16) $\sqrt{1 - \sin 2x}$ $(-\pi/4 < x < \pi/4)$

(17) $\sqrt{\sin x} \, \sin 2x$

(18) $\cot^6 x$

(19) $\dfrac{\cos^3 x}{\sin^2 x}$

(20) $\dfrac{1}{\sin(x - a) \sin(x - b)}$

(21) $\sin^2 x \cos^4 x$

(22) $\sqrt{\dfrac{x}{1 - x^3}}$

(23) $\dfrac{1}{5 + 4 \cos x + 3 \sin x}$

(24) $\dfrac{1}{x^{\frac{1}{2}} - x^{\frac{1}{3}}}$

(25) $\sqrt{\dfrac{1 - x}{1 + x}}$

(26) $\dfrac{\cos x}{\sqrt{1 - \cos x}}$ $(0 < x < \pi)$

(27) $\dfrac{\sqrt{5 - x}}{x}$

(28) $\dfrac{1}{(x - 1)^{\frac{3}{2}} (x - 2)^{\frac{1}{2}}}$

(29) $\sin^2 x \cos 2x$

(30) $\dfrac{3x + 1}{2x^2 + x + 1}$

(31) $\dfrac{1}{x\sqrt{x^4 - a^4}}$	(32) $\dfrac{1}{\sqrt{(x - 1)(4 - x)}}$	(33) $\dfrac{\sqrt{25 - x^2}}{x^2}$
(34) $\dfrac{1}{x\sqrt{2ax - x^2}}$ $(0 < x < 2a)$	(35) $\cos x \sin^2 2x$	(36) $\dfrac{3x + 1}{\sqrt{8 - 2x - x^2}}$
(37) $x^2 e^{3x}$	(38) $\sqrt{(3x - 1)(x + 2)}$	(39) $5^x e^{2x - 1}$
(40) $\dfrac{x^2}{x^4 + 1}$	(41) $x \sin x \cos 3x$	(42) $x\sqrt{2ax - x^2}$
(43) $\sin^{-1}\dfrac{x}{\sqrt{1 + x^2}}$	(44) $\dfrac{1}{x + \sqrt{x - 1}}$	(45) $\cos^{-1}\dfrac{1 - x^2}{1 + x^2}$ $(x < 0)$
(46) $\dfrac{x^3}{(1 + x^2)^{\frac{9}{2}}}$	(47) $\dfrac{x^2}{(x^2 - a^2)^{\frac{3}{2}}}$ $(x > 0,\ a > 0)$	(48) $\dfrac{x^2 + 1}{(x + 1)^2} e^x$
(49) $\dfrac{\sin 5x}{\sin x}$	(50) $x^2 \tan^{-1}x$	(51) $x \sin^2 x$
(52) $x \sec^2 x \tan x$	(53) $e^{-x} \sin^2 2x$	(54) $\dfrac{1}{x^4 - 1}$
(55) $2^x \cos^2 x$	(56) $\sec^4 x$	(57) $\dfrac{x^2}{(x^3 - 1)(x^3 + 4)}$
(58) $e^{2x} \sin 3x \sin x$	(59) $\sec^3 x$	(60) $\dfrac{x}{(3x^2 + 2)(x - 2)}$
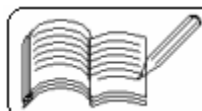
(61) $\dfrac{x^3}{(x^2 + 2)(x^2 + 5)}$	(62) $\dfrac{1}{6e^{2x} + 5e^x + 1}$	(63) $\dfrac{1}{(x - 1)(x^2 + 4)}$
(64) $\dfrac{\cos^{-1}\sqrt{x} - \sin^{-1}\sqrt{x}}{\cos^{-1}\sqrt{x} + \sin^{-1}\sqrt{x}}$	(65) $\dfrac{\sqrt{\sin x}}{\cos x}$	(66) $x^2 \cos (\log x)$
(67) $\dfrac{x}{(x^2 + a^2)(x^2 + b^2)}$	(68) $\dfrac{x^2 + 4x - 1}{x^3 - x}$	(69) $\dfrac{x^2}{(x^2 + 1)(x^2 + 2)}$
(70) $\dfrac{\sqrt{1 - \sin x}}{1 + \cos x} e^{-\frac{x}{2}}$ $(0 < x < \pi / 2)$	(71) $\dfrac{1}{x(x^3 + 1)}$	(72) $\dfrac{\sin x}{\sin 4x}$
(73) $\dfrac{1}{\cos x (1 + 2 \sin x)}$	(74) $\dfrac{1}{\sin x + \sin 2x}$	(75) $\sqrt{\tan x}$
(76) $\dfrac{x}{\sqrt{a - x}}$	(77) $\dfrac{x^4 + x^2 + 1}{x^2 + x + 1}$	(78) $(1 + x)\sqrt{1 - x}$
(79) $\sin x \cos x (\sin 2x + \cos 2x)$	(80) $\dfrac{\sin x + \cos x}{\sqrt{\sin 2x}}$	(81) $x\sqrt{\dfrac{a^2 - x^2}{a^2 + x^2}}$
(82) $\dfrac{\tan x}{\sqrt{3 + 4\tan^2 x}}$	(83) $\dfrac{1}{(e^x + e^{-2x})^{\frac{3}{2}}}$	(84) $\dfrac{1}{(2x + 1)\sqrt{4x + 3}}$
(85) $\dfrac{1 + x^2}{\sqrt{1 - x^2}}$	(86) $\dfrac{1}{(1 + x)\sqrt{1 - x^2}}$	(87) $\dfrac{1}{\cos 2x + 3 \sin^2 x}$
(88) $\dfrac{6x + 7}{\sqrt{(x - 5)(x - 4)}}$	(89) $\sin^4 3x \cos^2 3x$	(90) $\dfrac{\sqrt{\sec x + 1}}{}$ $0 < x < \pi, \ x \neq \pi / 2$

(91) $\dfrac{1}{a^2 - b^2\cos^2 x}$ ($a > b$)

(92) $\sqrt{\tan x} + \sqrt{\cot x}$

(93) $\dfrac{\tan x}{1 + \tan x + \tan^2 x}$

(94) $\dfrac{1}{(1 + x)\sqrt{1 + 2x - x^2}}$

(95) $\dfrac{x}{(x^2 + 4)\sqrt{x^2 + 1}}$

(96) $\dfrac{x^2 + 1}{x^4 + 7x^2 + 1}$

(97) $\dfrac{1}{\sin^4 x + \cos^4 x}$

(98) $\sqrt{\cot x}$

(99) $\dfrac{\sin x + \cos x}{9 + 16 \sin 2x}$

(100) $\dfrac{1}{\sec x + \csc x}$

(101) $\dfrac{4e^x + 6e^{-x}}{9e^x - 4e^{-x}}$

(102) $\dfrac{\sqrt{a} - \sqrt{x}}{1 - \sqrt{ax}}$

(103) $\dfrac{1}{x(x^n + 1)}$

(104) $\dfrac{1}{\sin x + \sec x}$

(105) $\tan^{-1}\sqrt{x}$

(106) $\dfrac{1 + \sqrt{x}}{1 + x^{\frac{1}{4}}}$

(107) $\dfrac{x}{1 + \sin x}$

(108) $\sin \sqrt{x}$

(109) $\tan x \, \tan 2x \, \tan 3x$

(110) $\dfrac{1}{x^3 \sqrt{x^4 - 1}}$

(111) $x \sin^3 x$

(112) $\tan^{-1}\sqrt{\dfrac{x}{a - x}}$

(113) $\dfrac{x(x + 1)(x + 2)}{(x + 3)(x + 4)(x + 5)}$

(114) $\sqrt{\dfrac{a + x}{x}}$

(115) $\dfrac{\tan x + \tan^3 x}{1 + \tan^3 x}$

(116) $\dfrac{x^2}{(x \sin x + \cos x)^2}$

(117) $\sqrt{\dfrac{x^{n - 2}}{1 - x^n}}$

(118) $\dfrac{1}{x^2 (1 + x^2)^2}$

(119) $\sin^{-1}\sqrt{\dfrac{x}{a + x}}$

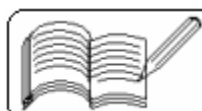(120) $\dfrac{1}{5 - 2\cos x - 2\sqrt{3} \sin x}$
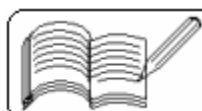
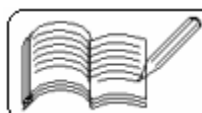|		
(121) $\sqrt{\dfrac{\sin(x - a)}{\sin(x + a)}}$	(122) $\dfrac{3 + 2\tan x}{4 + 3\tan x}$	(123) $\sqrt{\dfrac{1 - \sqrt{x}}{1 + \sqrt{x}}}$
(124) $\dfrac{1}{\sqrt{\sin^3 x \sin(x + \alpha)}}$	(125) $\sqrt{\dfrac{x - \alpha}{\beta - x}}$	(126) $\dfrac{\sin^2 x}{4 + \cos^2 x}$
(127) $\dfrac{1}{1 + \tan^4 x}$	(128) $\log\log x + \dfrac{1}{(\log x)^2}$	(129) $\dfrac{x^7}{x^{12} - 1}$
(130) $\dfrac{1}{(\sin x - 2\cos x)(2\sin x + \cos x)}$	(131) $\cot^{-1}(1 - x + x^2)$	(132) $\dfrac{\sin^3 x}{(1 + \cos^2 x)\sqrt{1 + \cos^2 x + \cos^4 x}}$
(133) $x(\tan^{-1}x)^2$	(134) $\dfrac{1}{\sqrt[4]{(x - 1)^3 (x + 2)^5}}$	(135) $\dfrac{x^3}{(x - 1)(x - 2)(x - 3)}$
(136) $\dfrac{\sin x - \cos x}{(\sin x + \cos x)\sqrt{\sin x \cos x + \sin^2 x \cos^2 x}}$		(137) $\dfrac{\sqrt{\cos 2x}}{\sin x}$

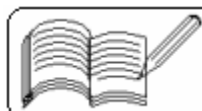## Answers

(Add constant C to all answers)

Answer:	Answer:	Answer:
[1] $\dfrac{x^3}{3} + \tan^{-1}x$	[2] $\dfrac{x^5}{5} - \dfrac{x^3}{3} + x + \tan^{-1}x$	[3] $\dfrac{x^3}{3} - x + \tan^{-1}x$
Answer:	Answer:	Answer:
[4] $\sin^{-1}\dfrac{x}{\log 2}$	[5] $\sec x + \tan x - x$	[6] $\log(e^x + e^{-x})$

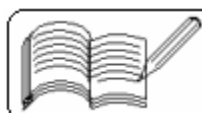| Answer:	Answer:	Answer:
[7] $\tan x - \cot x$	**[8]** $\dfrac{1}{ab} \tan^{-1}\left[\dfrac{b}{a} \tan x\right]$	**[9]** $\dfrac{x}{2} + \dfrac{1}{2} \log \| \cos x + \sin x \|$

Answer:	Answer:	Answer:
[10] $\dfrac{1}{3} \log \left\| \dfrac{\sqrt{1 - x^3} - 1}{\sqrt{1 - x^3} + 1} \right\|$	**[11]** $\dfrac{1}{2\sqrt{2}} \log \left\| \dfrac{x^2 - \sqrt{2}\,x + 1}{x^2 + \sqrt{2}\,x + 1} \right\|$	**[12]** $\dfrac{1}{14} \log \| 3\sin^2 x - 4\cos^2 x \|$

Answer:	Answer:	Answer:
[13] $-\sqrt{2}\,\sin x$	**[14]** $\dfrac{1}{4}\,(\tan^{-1} x^2)^2$	**[15]** $-2\sqrt{2}\ \sin\left(\dfrac{\pi}{4} - \dfrac{x}{2}\right) - \dfrac{1}{2} \log\left\|\tan\left(\dfrac{\pi}{8} - \dfrac{x}{4}\right)\right\|$

Answer:	Answer:	Answer:
[16] $\sin x + \cos x$	**[17]** $\dfrac{4\,(\sin x)^{\frac{5}{2}}}{5}$	**[18]** $-\dfrac{\cot^5 x}{5} + \dfrac{\cot^3 x}{3} - \cot x - x$

Answer:	Answer:	Answer:
[19] $-\dfrac{1}{\sin x} - \sin x$	**[20]** $\dfrac{1}{\sin(a - b)} \log\left\|\dfrac{\sin(x - a)}{\sin(x - b)}\right\|$	**[21]** $\dfrac{1}{192}(12x - 3\sin 4x + 3\sin 2x - \sin 6x)$

Answer:	Answer:	Answer:
[22] $\dfrac{2}{3}\sin^{-1} x^{\frac{3}{2}}$	**[23]** $-\dfrac{2}{\tan\dfrac{x}{2} + 3}$	**[24]** $2x^{\frac{1}{2}} - 3x^{\frac{1}{3}} + 6x^{\frac{1}{6}} - 6\log\left(1 + x^{\frac{1}{6}}\right)$

Answer:	Answer:	Answer:
[25] $\sin^{-1} x + \sqrt{1 - x^2}$	**[26]** $\sqrt{2}\ \log\left\|\tan\dfrac{x}{4}\right\| + 2\sqrt{2}\cos\dfrac{x}{2}$	**[27]** $2\sqrt{5 - x} - \sqrt{5}\ \log\left\|\dfrac{\sqrt{5 - x} + \sqrt{5}}{\sqrt{5 - x} - \sqrt{5}}\right\|$

Answer:	Answer:	Answer:
[28] $2\sqrt{\dfrac{x - 2}{x - 1}}$	**[29]** $\dfrac{\sin 2x}{4} - \dfrac{x}{4} - \dfrac{\sin 4x}{16}$	**[30]** $\dfrac{3}{4} \log\left\|2x^2 + x + 1\right\| + \dfrac{1}{2\sqrt{7}} \tan^{-1}\dfrac{4x + 1}{\sqrt{7}}$

Answer:	Answer:	Answer:
[31] $\dfrac{1}{2a^2} \sec^{-1}\dfrac{x^2}{a^2}$	**[32]** $2\sin^{-1}\sqrt{\dfrac{x - 1}{3}}$	**[33]** $-\dfrac{\sqrt{25 - x^2}}{x} - \sin^{-1}\dfrac{x}{5}$

Answer:	Answer:	Answer:
[34] $-\dfrac{1}{a}\sqrt{\dfrac{2a-x}{a}}$	[35] $\dfrac{4}{3}\sin^3 x - \dfrac{4}{5}\sin^5 x$	[36] $-3\sqrt{8-2x-x^2} - 2\sin^{-1}\dfrac{x+1}{3}$

Answer:	Answer:
[37] $\left[\dfrac{x^2}{3} - \dfrac{2x}{9} + \dfrac{2}{27}\right]e^{3x}$	[38] $\dfrac{6x+5}{12}\sqrt{(3x-1)(x+2)} - \dfrac{49}{24\sqrt{3}}\log\left|\dfrac{6x+5}{2\sqrt{3}} + \sqrt{(3x-1)(x+2)}\right|$

Answer:	Answer:
[39] $\dfrac{5^x\,e^{2x-1}}{(\log 5 + 2)}$	[40] $\dfrac{1}{2\sqrt{2}}\tan^{-1}\dfrac{x^2-1}{\sqrt{2}\,x} + \dfrac{1}{4\sqrt{2}}\log\left|\dfrac{x^2-\sqrt{2}\,x+1}{x^2+\sqrt{2}\,x+1}\right|$

Answer:	Answer:
[41] $\dfrac{\sin 4x}{32} - \dfrac{\sin 2x}{8} + \dfrac{x}{4}\cos 2x - \dfrac{x}{8}\cos 4x$	[42] $\dfrac{a^3}{2}\sin^{-1}\dfrac{x-a}{a} + \dfrac{a}{2}(x-a)\sqrt{2ax-x^2} - \dfrac{1}{3}(2ax-x^2)^{\frac{3}{2}}$

Answer:	Answer:
[43] $x\tan^{-1}x - \dfrac{1}{2}\log(1+x^2)$	[44] $\log\left|x+\sqrt{x-1}\right| - \dfrac{2}{\sqrt{3}}\tan^{-1}\dfrac{2\sqrt{x-1}+1}{\sqrt{3}}$

Answer:	Answer:
[45] $-2\left[x\tan^{-1}x - \log\sqrt{1+x^2}\right]$	[46] $\dfrac{1}{7(1+x^2)^{\frac{7}{2}}} - \dfrac{1}{5(1+x^2)^{\frac{5}{2}}}$

Answer:	Answer:	Answer:
[47] $\log\left|x+\sqrt{x^2-a^2}\right| - \dfrac{x}{\sqrt{x^2-a^2}}$	[48] $e^x\left[\dfrac{x-1}{x+1}\right]$	[49] $x + \sin 2x + \dfrac{\sin 4x}{2}$

Answer: [50]	Answer: [51]	Answer: [52]
$\dfrac{x^3}{3}\tan^{-1}x - \dfrac{1}{6}[x^2 - \log(1+x^2)]$	$\dfrac{x^2}{4} - \dfrac{x\sin 2x}{4} - \dfrac{\cos 2x}{8}$	$\dfrac{x\sec^2 x}{2} - \dfrac{\tan x}{2}$

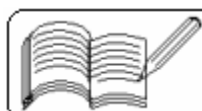| Answer:	Answer:
[53] $-\dfrac{e^{-x}}{2}\left[1 - \dfrac{1}{\sqrt{17}}\cos(4x + \tan^{-1} 4)\right]$	[54] $\dfrac{1}{4}\log\left|\dfrac{x-1}{x+1}\right| - \dfrac{1}{2}\tan^{-1}x$

Answer:

[55] $\dfrac{2^{x-1}}{\log 2} + \dfrac{2^{x-1}\cos\left[2x - \tan^{-1}\dfrac{2}{\log 2}\right]}{\sqrt{(\log 2)^2 + 4}}$

Answer:

[56] $\tan x + \dfrac{\tan^3 x}{3}$

Answer:

[57] $\dfrac{1}{15}\log\left|\dfrac{x^3 - 1}{x^3 + 4}\right|$

Answer:

[58] $\dfrac{e^{2x}}{8}(\sin 2x + \cos 2x) - \dfrac{e^{2x}}{20}(\cos 4x + 2\sin 4x)$

Answer:

[59] $\dfrac{1}{2}(\sec x \tan x + \log|\sec x + \tan x|)$

Answer:

[60] $\dfrac{\log|x - 2|}{7} - \dfrac{1}{14}\log\left|3x^2 + 2\right| + \dfrac{1}{7\sqrt{6}}\tan^{-1}\dfrac{\sqrt{3}\,x}{\sqrt{2}}$

Answer:

[61] $\dfrac{5}{6}\log(x^2 + 5) - \dfrac{1}{3}\log(x^2 + 2)$

Answer:

[62] $\log\left[e^x(3e^x + 1)^{-3}(2e^x + 1)^2\right]$

Answer:

[63]
$\dfrac{1}{5}\log|x - 1| - \dfrac{1}{10}\log(x^2 + 4) - \dfrac{1}{10}\tan^{-1}\dfrac{x}{2}$

Answer:

[64]
$\dfrac{2x - 1}{\pi}(\cos^{-1}\sqrt{x} - \sin^{-1}\sqrt{x}) - \dfrac{2}{\pi}\sqrt{x - x^2}$

Answer:

[65] $\dfrac{1}{2}\log\left|\dfrac{1 + \sqrt{\sin x}}{1 - \sqrt{\sin x}}\right| - \tan^{-1}\sqrt{\sin x}$

Answer:

[66] $\dfrac{x^3}{10}[3\cos(\log x) + \sin(\log x)]$

Answer:

[67] $\dfrac{1}{2(a^2 - b^2)}\log\left[\dfrac{x^2 + b^2}{x^2 + a^2}\right]$

Answer:

[68] $\log\left|\dfrac{x(x - 1)^2}{(x + 1)^2}\right|$

Answer:

[69] $-\tan^{-1}x + \sqrt{2}\tan^{-1}\dfrac{x}{\sqrt{2}}$

Answer:

[70] $-e^{-\frac{x}{2}}\sec\dfrac{x}{2}$

Answer:

[71] $\dfrac{1}{3}\log\left|\dfrac{x^3}{x^3 + 1}\right|$

Answer:

[72] $\dfrac{1}{8}\log\left|\dfrac{\sin x - 1}{\sin x + 1}\right| - \dfrac{1}{4\sqrt{2}}\log\left|\dfrac{\sqrt{2}\sin x - 1}{\sqrt{2}\sin x + 1}\right|$

Answer:

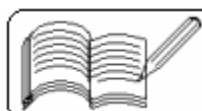[73] $-\dfrac{1}{2}\log(1 + \sin x) - \dfrac{1}{6}\log(1 - \sin x) + \dfrac{2}{3}\log|1 + 2\sin x|$

Answer:

[74] $\dfrac{1}{6}\log(1 - \cos x) + \dfrac{1}{2}\log(1 + \cos x) - \dfrac{2}{3}\log|1 + 2\cos x|$

Answer:

[75] $\dfrac{1}{\sqrt{2}}\tan^{-1}\left[\dfrac{\tan x - 1}{\sqrt{2\tan x}}\right] + \dfrac{1}{2\sqrt{2}}\log\left|\dfrac{\tan x + 1 - \sqrt{2\tan x}}{\tan x + 1 + \sqrt{2\tan x}}\right|$

Answer:

[76] $-2a(a - x)^{\frac{1}{2}} + \dfrac{2}{3}(a - x)^{\frac{3}{2}}$

Answer:

[77] $\dfrac{x^3}{3} - \dfrac{x^2}{2} + x$

Answer:

[78] $-\dfrac{4}{3}(1 - x)^{\frac{3}{2}} + \dfrac{2}{5}(1 - x)^{\frac{5}{2}}$

Answer:

[79] $\dfrac{x}{4} - \dfrac{\sin 4x}{16} - \dfrac{\cos 4x}{16}$

Answer:

[80] $\sin^{-1}(\sin x - \cos x)$

Answer:

[81] $\dfrac{1}{2}\left[\sqrt{a^4 - x^4} - a^2\cos^{-1}\dfrac{x^2}{a^2}\right]$

Answer:

[82] $\tan^{-1}\sqrt{3 + 4\tan^2 x}$

Answer:

[83] $-\dfrac{2}{3\sqrt{e^{3x} + 1}}$

Answer:

[84] $\dfrac{1}{2}\log\left|\dfrac{\sqrt{4x + 3} - 1}{\sqrt{4x + 3} + 1}\right|$

Answer:

[85] $\dfrac{3}{2}\sin^{-1}x - \dfrac{x\sqrt{1 - x^2}}{2}$

Answer:

[86] $-\sqrt{\dfrac{1 - x}{1 + x}}$

Answer:

[87] $\dfrac{1}{\sqrt{2}}\tan^{-1}(\sqrt{2}\tan x)$

Answer:

[88]

$6\sqrt{x^2 - 9x + 20} + 34\log\left|x - \dfrac{9}{2} + \sqrt{x^2 - 9x + 20}\right|$

Answer:

[89] $\dfrac{x}{16} - \dfrac{\sin 12x}{192} - \dfrac{\sin^3 6x}{144}$

Answer:

[90] $2\sin^{-1}\left[\sqrt{2}\sin\dfrac{x}{2}\right]$

Answer:

[91] $\dfrac{1}{a\sqrt{a^2 - b^2}}\tan^{-1}\left[\dfrac{a}{\sqrt{a^2 - b^2}}\tan x\right]$

Answer:

[92] $\sqrt{2}\sin^{-1}(\sin x - \cos x)$

Answer:

[93] $x - \dfrac{2}{\sqrt{3}}\tan^{-1}\left[\dfrac{2\tan x + 1}{\sqrt{3}}\right]$

Answer:

[94] $\dfrac{1}{\sqrt{2}}\sin^{-1}\left[\dfrac{\sqrt{2}\,x}{1 + x}\right]$

Answer:

[95] $\dfrac{1}{\sqrt{3}}\tan^{-1}\sqrt{\dfrac{x^2 + 1}{3}}$

Answer:

[96] $\dfrac{1}{3}\tan^{-1}\left[\dfrac{x^2 - 1}{3x}\right]$

Answer:

[97] $\dfrac{1}{\sqrt{2}}\tan^{-1}\left[\dfrac{\tan 2x}{\sqrt{2}}\right]$

Answer:

$[98]$ $\quad -\dfrac{1}{\sqrt{2}}\tan^{-1}\left[\dfrac{\cot x - 1}{\sqrt{2\cot x}}\right] - \dfrac{1}{2\sqrt{2}}\log\left|\dfrac{\cot x - \sqrt{2\cot x} + 1}{\cot x + \sqrt{2\cot x} + 1}\right|$

Answer:

$[99]$ $\quad \dfrac{1}{40}\log\left|\dfrac{5 + 4(\sin x - \cos x)}{5 - 4(\sin x - \cos x)}\right|$

Answer:

$[100]$ $\quad \dfrac{1}{2}(\sin x - \cos x) - \dfrac{1}{2\sqrt{2}}\log\left|\tan\left[\dfrac{x}{2} + \dfrac{\pi}{8}\right]\right|$

Answer:

$[101]$

$-\dfrac{3x}{2} + \dfrac{35}{36}\log\left|9e^{2x} - 4\right|$

Answer:

$[102]$

$\dfrac{2}{a^{\frac{3}{2}}}\left[(1 - a)\log\left|1 - \sqrt{ax}\right| + (a - 2)(1 - \sqrt{ax}) + \dfrac{1}{2}(1 - \sqrt{ax})^2\right]$

Answer:

$[103]$ $\quad \dfrac{1}{n}\log\left|\dfrac{x^n}{x^n + 1}\right|$

Answer:

$[104]$ $\quad \dfrac{1}{2\sqrt{3}}\log\left|\dfrac{\sqrt{3} + (\sin x - \cos x)}{\sqrt{3} - (\sin x - \cos x)}\right| + \tan^{-1}(\sin x + \cos x)$

Answer:

$[105]$ $\quad (x + 1)\tan^{-1}\sqrt{x} - \sqrt{x}$

Answer:

$[106]$ $\quad \dfrac{4}{5}x^{\frac{5}{4}} - x + \dfrac{8}{3}x^{\frac{3}{4}} - 4x^{\frac{1}{2}} + 8x^{\frac{1}{4}} - 8\log\left|x^{\frac{1}{4}} + 1\right|$

Answer:

$[107]$ $\quad x(\tan x - \sec x) + \log(1 + \sin x)$

Answer:

$[108]$ $\quad 2\left[\sin\sqrt{x} - \sqrt{x}\cos\sqrt{x}\right]$

Answer:

$[109]$ $\quad \dfrac{1}{3}\log|\sec 3x| - \dfrac{1}{2}\log|\sec 2x| - \log|\sec x|$

Answer:

$[110]$ $\quad \dfrac{1}{2}\sqrt{1 - x^{-4}}$

Answer:

$[111]$ $\quad \dfrac{3\sin x}{4} - \dfrac{3x\cos x}{4} + \dfrac{x\cos 3x}{12} - \dfrac{\sin 3x}{36}$

Answer:

$[112]$ $\quad \left(\dfrac{2x - a}{2}\right)\sin^{-1}\sqrt{\dfrac{x}{a}} - \dfrac{1}{2}\sqrt{ax - x^2}$

Answer:

$[113]$ $x - 3\log|x + 3| + 24\log|x + 4| - 30\log|x + 5|$

Answer:

$[114]$ $\quad \sqrt{ax + x^2} + a\log\left|\sqrt{x} + \sqrt{x + a}\right|$

Answer:

$[115]$ $-\dfrac{1}{3}\log\left|1+\tan x\right| + \dfrac{1}{6}\log\left|\tan^2 x - \tan x + 1\right| + \dfrac{1}{\sqrt{3}}\tan^{-1}\dfrac{2\tan x - 1}{\sqrt{3}}$

Answer:

$[116]$ $\dfrac{\sin x - x\cos x}{\cos x + x\sin x}$

Answer:

$[117]$ $\dfrac{2}{n}\sin^{-1}x^{\frac{n}{2}}$

Answer:

$[118]$ $-\dfrac{1}{x} - \dfrac{3}{2}\tan^{-1}x - \dfrac{x}{2(1+x^2)}$

Answer:

$[119]$ $(x+a)\tan^{-1}\sqrt{\dfrac{x}{a}} - \sqrt{ax}$

Answer:

$[120]$ $\dfrac{2}{3}\tan^{-1}\left[3\tan\left(\dfrac{x}{2} - \dfrac{\pi}{6}\right)\right]$

Answer:

$[121]$

$\cos a\cos^{-1}\left[\dfrac{\cos x}{\cos a}\right] - \sin a\,\log\left|\sin x + \sqrt{\sin^2 x - \sin^2 a}\right|$

Answer:

$[122]$

$\dfrac{18x}{25} + \dfrac{1}{25}\log\left|4\cos x + 3\sin x\right|$

Answer:

$[123]$ $\sqrt{x - x^2} - 2\sqrt{1-x} + \cos^{-1}\sqrt{x}$

Answer:

$[124]$ $-\dfrac{2}{\sin\alpha}\sqrt{\cos\alpha + \sin\alpha\cot x}$

Answer:

$[125]$ $-\sqrt{(\beta - x)(x - \alpha)} - (\beta - \alpha)\sin^{-1}\sqrt{\dfrac{\beta - x}{\beta - \alpha}}$

Answer:

$[126]$ $\dfrac{\sqrt{5}}{2}\tan^{-1}\left(\dfrac{2\tan x}{\sqrt{5}}\right) - x$

Answer:

$[127]$ $\dfrac{x}{2} + \dfrac{1}{4\sqrt{2}}\log\left|\dfrac{\sqrt{2} + \sin 2x}{\sqrt{2} - \sin 2x}\right|$

Answer:

$[128]$ $x\log\log\left|x\right| - \dfrac{x}{\log x}$

Answer:

$[129]$ $\dfrac{1}{12}\log\left|x^4 - 1\right| - \dfrac{1}{24}\log\left|x^8 + x^4 + 1\right| + \dfrac{1}{4\sqrt{3}}\tan^{-1}\left[\dfrac{2x^4 + 1}{\sqrt{3}}\right]$

Answer:

$[130]$ $\dfrac{1}{5}\log\left|\dfrac{\tan x - 2}{2\tan x + 1}\right|$

Answer:

$[131]$ $x\cot^{-1}(1 - x + x^2) + \dfrac{1}{2}\log\left|\dfrac{x^2 - 2x + 2}{x^2 + 1}\right| + \tan^{-1}(x-1)$

Answer:

$[132]$ $\tan^{-1}\sqrt{\sec^2 x + 1 + \cos^2 x}$

Answer:

$[133]$ $\dfrac{x^2}{2}(\tan^{-1}x)^2 - x\tan^{-1}x + \log\left|\sec(\tan^{-1}x)\right| + \dfrac{1}{2}(\tan^{-1}x)^2$

Answer:

$[134]$ $\dfrac{4}{3}\sqrt[4]{\dfrac{x-1}{x+2}}$

Answer:

$[135]$ $x + \dfrac{1}{2}\log\left|x-1\right| - 8\log\left|x-2\right| + \dfrac{27}{2}\log\left|x-3\right|$

Answer:

$[136]$ $\csc^{-1}(1 + \sin 2x)$

Answer: $[137]$ $\dfrac{1}{\sqrt{2}}\log\left|\dfrac{\sqrt{2} + \sqrt{1 - \tan^2 x}}{\sqrt{2} - \sqrt{1 - \tan^2 x}}\right| - \dfrac{1}{2}\log\left|\dfrac{1 + \sqrt{1 - \tan^2 x}}{1 - \sqrt{1 - \tan^2 x}}\right|$