

Integrate the following functions with respect to x:

(1) $\frac{x^4 + x^2 + 1}{x^2 + 1}$	(2) $\frac{x^6 + 2}{x^2 + 1}$	(3) $\frac{x^4}{x^2 + 1}$
(4) $\left[ \left( \log \frac{1}{2} \right)^2 - x^2 \right]^{-\frac{1}{2}}$	(5) $\frac{\sin x}{1 - \sin x}$	(6) $\frac{e^{2x} - 1}{e^{2x} + 1}$
(7) $\frac{1}{\cos^2 x \sin^2 x}$	(8) $\frac{1}{a^2 \cos^2 x + b^2 \sin^2 x}$	(9) $\frac{1}{1 + \tan x}$
(10) $\frac{1}{x \sqrt{1 - x^3}}$	(11) $\frac{x^2 - 1}{x^4 + 1}$	(12) $\frac{\sin x \cos x}{3 \sin^2 x - 4 \cos^2 x}$
(13) $\frac{\sqrt{1 + \cos 2x}}{(\pi/2 < x < \pi)}$	(14) $\frac{x \tan^{-1} x^2}{1 + x^4}$	(15) $\frac{\sin x}{\sqrt{1 + \sin x}}$ $(0 < x < \pi)$
(16) $\sqrt{1 - \sin 2x}$ $(-\pi/4 < x < \pi/4)$	(17) $\sqrt{\sin x} \sin 2x$	(18) $\cot^6 x$
(19) $\frac{\cos^3 x}{\sin^2 x}$	(20) $\frac{1}{\sin(x-a)\sin(x-b)}$	(21) $\sin^2 x \cos^4 x$
(22) $\frac{x}{\sqrt{1 - x^3}}$	(23) $\frac{1}{5 + 4 \cos x + 3 \sin x}$	(24) $\frac{1}{x^{\frac{1}{2}} - x^{\frac{1}{3}}}$
(25) $\frac{\sqrt{1-x}}{\sqrt{1+x}}$	(26) $\frac{\cos x}{\sqrt{1 - \cos x}}$ $(0 < x < \pi)$	(27) $\frac{\sqrt{5-x}}{x}$
(28) $\frac{1}{(x-1)^{\frac{3}{2}}(x-2)^{\frac{1}{2}}}$	(29) $\sin^2 x \cos 2x$	(30) $\frac{3x+1}{2x^2+x+1}$

(31) $\frac{1}{x \sqrt{x^4 - a^4}}$	(32) $\frac{1}{\sqrt{(x-1)(4-x)}}$	(33) $\frac{\sqrt{25-x^2}}{x^2}$
(34) $\frac{1}{x \sqrt{2ax-x^2}}$ $(0 < x < 2a)$	(35) $\cos x \sin^2 2x$	(36) $\frac{3x+1}{\sqrt{8-2x-x^2}}$
(37) $x^2 e^{3x}$	(38) $\sqrt{(3x-1)(x+2)}$	(39) $5 e^{2x-1}$
(40) $\frac{x^2}{x^4 + 1}$	(41) $x \sin x \cos 3x$	(42) $x \sqrt{2ax-x^2}$
(43) $\sin^{-1} \frac{x}{\sqrt{1+x^2}}$	(44) $\frac{1}{x+\sqrt{-1}}$	(45) $\cos^{-1} \frac{1-x^2}{1+x^2}$ $(x < 0)$
(46) $\frac{x^3}{(1+x^2)^{\frac{9}{2}}}$	(47) $\frac{x^2}{(x^2-a^2)^{\frac{3}{2}}}$ $(x > 0, a > 0)$	(48) $\frac{x^2+1}{(x+1)^2} e^x$
(49) $\frac{\sin 5x}{\sin x}$	(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) $\frac{1}{x^4 - 1}$
(55) $2^x \cos^2 x$	(56) $\sec^4 x$	(57) $\frac{x^2}{(x^3-1)(x^3+4)}$
(58) $e^{2x} \sin 3x \sin x$	(59) $\sec^3 x$	(60) $\frac{x}{(3x^2+2)(x-2)}$

(61) $\frac{x^3}{(x^2 + 2)(x^2 + 5)}$	(62) $\frac{1}{6e^{2x} + 5e^x + 1}$	(63) $\frac{1}{(x - 1)(x^2 + 4)}$
(64) $\frac{\cos^{-1}\sqrt{x} - \sin^{-1}\sqrt{x}}{\cos^{-1}\sqrt{x} + \sin^{-1}\sqrt{x}}$	(65) $\frac{\sqrt{\sin x}}{\cos x}$	(66) $x^2 (\log x)$
(67) $\frac{x}{(x^2 + a^2)(x^2 + b^2)}$	(68) $\frac{x^2 + 4x - 1}{x^3 - x}$	(69) $\frac{x^2}{(x^2 + 1)(x^2 + 2)}$
(70) $\frac{\sqrt{1 - \sin x}}{1 + \cos x} e^{-\frac{x}{2}}$ $(0 < x < \pi/2)$	(71) $\frac{1}{x(x^3 + 1)}$	(72) $\frac{\sin x}{\sin 4x}$
(73) $\frac{1}{\cos x(1 + 2\sin x)}$	(74) $\frac{1}{\sin x + \sin 2x}$	(75) $\sqrt{\tan x}$
(76) $\frac{x}{\sqrt{a - x}}$	(77) $\frac{x^4 + x^2 + 1}{x^2 + x + 1}$	(78) $(1 + x)\sqrt{1 - x}$
(79) $\sin x \cos x (\sin 2x + \cos 2x)$	(80) $\frac{\sin x + \cos x}{\sqrt{\sin 2x}}$	(81) $x \sqrt{\frac{a^2 - x^2}{a^2 + x^2}}$
(82) $\frac{\tan x}{\sqrt[3]{4\tan^2 x}}$	(83) $\frac{1}{(e^x + e^{-2x})^{\frac{3}{2}}}$	(84) $\frac{1}{(2x+1)\sqrt{4x+3}}$
(85) $\frac{1+x^2}{\sqrt{1-x^2}}$	(86) $\frac{1}{(1+x)\sqrt{1-x^2}}$	(87) $\frac{1}{\cos 2x + 3\sin^2 x}$
(88) $\frac{6x+7}{\sqrt{(x-5)(x-4)}}$	(89) $\sin^4 3x \cos^2 3x$	(90) $\sqrt{\sec x + 1}$ $0 < x < \pi, x \neq \pi/2$

(91) $\frac{1}{a^2 - b^2 \cos^2 x}$ (a > b)	(92) $\sqrt{\tan x} + \sqrt{\cot x}$	(93) $\frac{\tan x}{1 + \tan x + \tan^2 x}$
(94) $\frac{1}{(1+x)\sqrt{1+2x-x^2}}$	(95) $\frac{x}{(x^2+4)\sqrt{x^2+1}}$	(96) $\frac{x^2+1}{x^2+7x+1}$
(97) $\frac{1}{\sin^4 x + \cos^4 x}$	(98) $\sqrt{\cot x}$	(99) $\frac{\sin x + \cos x}{9 + 16 \sin 2x}$
(100) $\frac{1}{\sec x + \operatorname{cosec} x}$	(101) $\frac{4e^x + 6e^{-x}}{9e^x - 4e^{-x}}$	(102) $\frac{\sqrt{a} - \sqrt{x}}{1 - \sqrt{ax}}$
(103) $\frac{1}{x(x^n + 1)}$	(104) $\frac{1}{\sin x + \sec x}$	(105) $\tan^{-1} \sqrt{x}$
(106) $\frac{1 + \sqrt{x}}{1 + x^4}$	(107) $\frac{x}{1 + \sin x}$	(108) $\sin \sqrt{x}$
(109) $\tan x \tan 2x \tan 3x$	(110) $\frac{1}{x^3 \sqrt{x^4 - 1}}$	(111) $x \sin^3 x$
(112) $\tan^{-1} \frac{x}{\sqrt{a-x}}$	(113) $\frac{x(x+1)(x+2)}{(x+3)(x+4)(x+5)}$	(114) $\sqrt{\frac{a+x}{x}}$
(115) $\frac{\tan x + \tan^3 x}{1 + \tan^3 x}$	(116) $\frac{x^2}{(\sin x + \cos x)^2}$	(117) $\sqrt{\frac{x^{n-2}}{1-x^n}}$
(118) $\frac{1}{x^2 (1+x^2)^2}$	(119) $\sin^{-1} \sqrt{\frac{x}{a+x}}$	(120) $\frac{1}{5 - 2\cos x - 2\sqrt{3}\sin x}$

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

Answers

(Add constant C to all answers)

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

Answer: [ 7 ] $\tan x - \cot x$	Answer: [ 8 ] $\frac{1}{ab} \tan^{-1} \left[ \frac{b}{a} \tan x \right]$	Answer: [ 9 ] $\frac{x}{2} + \frac{1}{2} \log   \cos x + \sin x  $
Answer: [ 10 ] $\frac{1}{3} \log \left  \frac{\sqrt{1-x^3}-1}{\sqrt{1-x^3}+1} \right $	Answer: [ 11 ] $\frac{1}{2\sqrt{2}} \log \left  \frac{x^2-\sqrt{2}x+1}{x^2+\sqrt{2}x+1} \right $	Answer: [ 12 ] $\frac{1}{14} \log   3 \sin x - 4 \cos^2 x  $
Answer: [ 13 ] $-\sqrt{2} \sin x$	Answer: [ 14 ] $\frac{1}{4} (\tan^{-1} x^2)^2$	Answer: [ 15 ] $-2\sqrt{2} \sin \left( \frac{\pi}{4} - \frac{x}{2} \right) - \frac{1}{2} \log   \tan \left( \frac{\pi}{8} - \frac{x}{4} \right)  $
Answer: [ 16 ] $\sin x + \cos x$	Answer: [ 17 ] $\frac{4(\sin x)^2}{5}$	Answer: [ 18 ] $-\frac{\cot^5 x}{5} + \frac{\cot^3 x}{3} - \cot x - x$
Answer: [ 19 ] $-\frac{1}{\sin x} - \sin x$	Answer: [ 20 ] $\frac{1}{\sin(a-b)} \log \left  \frac{\sin(x-a)}{\sin(x-b)} \right $	Answer: [ 21 ] $\frac{1}{192} (12x - 3 \sin 4x + 3 \sin 2x - \sin 6x)$
Answer: [ 22 ] $\frac{2}{3} \sin^{-1} x^{\frac{3}{2}}$	Answer: [ 23 ] $-\frac{2}{\tan \frac{x}{2} + 3}$	Answer: [ 24 ] $2x^{\frac{1}{2}} - 3x^{\frac{1}{3}} + 6x^{\frac{1}{6}} - 6 \log(1+x^6)$
Answer: [ 25 ] $\frac{\sin^{-1} x}{\sin^{-1} x + \sqrt{1-x^2}}$	Answer: [ 26 ] $\sqrt{2} \log \left  \tan \frac{x}{4} \right  + 2\sqrt{2} \cos \frac{x}{2}$	Answer: [ 27 ] $2\sqrt{5-x} - \sqrt{5} \log \left  \frac{\sqrt{5-x} + \sqrt{5}}{\sqrt{5-x} - \sqrt{5}} \right $
Answer: [ 28 ] $2\sqrt{\frac{x-2}{x-1}}$	Answer: [ 29 ] $\frac{\sin 2x}{4} - \frac{x}{4} - \frac{\sin 4x}{16}$	Answer: [ 30 ] $\frac{3}{4} \log \left  2x^2 + x + 1 \right  + \frac{1}{2\sqrt{7}} \tan^{-1} \frac{4x+1}{\sqrt{7}}$
Answer: [ 31 ] $\frac{1}{2a^2} \sec^{-1} \frac{x^2}{a^2}$	Answer: [ 32 ] $2 \sin^{-1} \sqrt{\frac{x-1}{3}}$	Answer: [ 33 ] $-\frac{\sqrt{25-x^2}}{x} - \sin^{-1} \frac{x}{5}$

Answer: [34] $-\frac{1}{a} \sqrt{\frac{2a-x}{a}}$	Answer: [35] $\frac{4}{3} \sin^3 x - \frac{4}{5} \sin^5 x$	Answer: [36] $-3\sqrt{8-2x-x^2} - 2 \sin^{-1} \frac{x+1}{3}$
Answer: [37] $\left[ \frac{x^2}{3} - \frac{2x}{9} + \frac{2}{27} \right] e^{3x}$	Answer: [38] $\frac{6x+5}{12} \sqrt{(3x-1)(x+2)} - \frac{49}{24\sqrt{3}} \log \left  \frac{6x+5}{2\sqrt{3}} + \sqrt{(3x-1)(x+2)} \right $	
Answer: [39] $\frac{5^x e^{2x-1}}{(\log 5 + 2)}$	Answer: [40] $\frac{1}{2\sqrt{2}} \tan^{-1} \frac{x^2-1}{\sqrt{2}x} + \frac{1}{4\sqrt{2}} \log \left  \frac{x^2-\sqrt{2}x+1}{x^2+\sqrt{2}x+1} \right $	
Answer: [41] $\frac{\sin 4x}{32} - \frac{\sin 2x}{8} + \frac{x}{4} \cos 2x - \frac{x}{8} \cos 4x$	Answer: [42] $\frac{a^3}{2} \sin^{-1} \frac{x-a}{a} + \frac{a}{2} (x-a) \sqrt{2ax-x^2} - \frac{1}{3} (2ax-x^2)^{\frac{3}{2}}$	
Answer: [43] $x \tan^{-1} x - \frac{1}{2} \log(1+x^2)$	Answer: [44] $\log  x + \sqrt{x-1}  - \frac{2}{\sqrt{3}} \tan^{-1} \frac{2\sqrt{x-1}+1}{\sqrt{3}}$	
Answer: [45] $-2 \left[ x \tan^{-1} x - \log \sqrt{1+x^2} \right]$	Answer: [46] $\frac{1}{7(1+x^2)^{\frac{7}{2}}} - \frac{1}{5(1+x^2)^{\frac{5}{2}}}$	
Answer: [47] $\log  x + \sqrt{x^2 - a^2}  - \frac{x}{\sqrt{x^2 - a^2}}$	Answer: [48] $e^x \left[ \frac{x-1}{x+1} \right]$	Answer: [49] $x + \sin 2x + \frac{\sin 4x}{2}$
Answer: [50] $\frac{x^3}{3} \tan^{-1} x - \frac{1}{6} [x^2 - \log(1+x^2)]$	Answer: [51] $\frac{x^2}{4} - \frac{x \sin 2x}{4} - \frac{\cos 2x}{8}$	Answer: [52] $\frac{x \sec^2 x}{2} - \frac{\tan x}{2}$
Answer: [53] $-\frac{e^{-x}}{2} \left[ 1 - \frac{1}{\sqrt{17}} \cos(4x + \tan^{-1} 4) \right]$	Answer: [54] $\frac{1}{4} \log \left  \frac{x-1}{x+1} \right  - \frac{1}{2} \tan^{-1} x$	

<p>Answer:</p> <p>[55] <math>\frac{2^x - 1}{\log 2} + \frac{2^x - 1 \cos \left[ 2x - \tan^{-1} \frac{2}{\log 2} \right]}{\sqrt{(\log 2)^2 + 4}}</math></p>	<p>Answer:</p> <p>[56] <math>\tan x + \frac{\tan^3 x}{3}</math></p>	
<p>Answer:</p> <p>[57] <math>\frac{1}{15} \log \left  \frac{x^3 - 1}{x^3 + 4} \right </math></p>	<p>Answer:</p> <p>[58] <math>\frac{e^{2x}}{8} (\sin 2x + \cos 2x) - \frac{e^{2x}}{20} (\cos 4x + 2 \sin 4x)</math></p>	
<p>Answer:</p> <p>[59] <math>\frac{1}{2} (\sec x \tan x + \log  \sec x + \tan x )</math></p>	<p>Answer:</p> <p>[60] <math>\frac{\log x-2 }{7} - \frac{1}{14} \log 3x^2 + 2  + \frac{1}{7\sqrt{6}} \tan^{-1} \frac{\sqrt{3}x}{\sqrt{2}}</math></p>	
<p>Answer:</p> <p>[61] <math>\frac{5}{6} \log(x^2 + 5) - \frac{1}{3} \log(x^2 + 2)</math></p>	<p>Answer:</p> <p>[62] <math>\log \left[ e^{-3} (3e^x + 1)^{-3} (2e^x + 1)^2 \right]</math></p>	
<p>Answer:</p> <p>[63] <math>\frac{1}{5} \log x-1  - \frac{1}{10} \log(x^2 + 4) - \frac{1}{1} \tan^{-1} \frac{x}{2}</math></p>	<p>Answer:</p> <p>[64] <math>\frac{2x-1}{\pi} (\cos^{-1} \sqrt{x} - \sin^{-1} \sqrt{x}) - \frac{2}{\pi} \sqrt{x-x^2}</math></p>	
<p>Answer:</p> <p>[65] <math>\frac{1}{2} \log \left  \frac{1 + \sqrt{\sin x}}{1 - \sqrt{\sin x}} \right  - \tan^{-1} \sqrt{\sin x}</math></p>	<p>Answer:</p> <p>[66] <math>\frac{x^3}{10} [3 \cos(\log x) + \sin(\log x)]</math></p>	
<p>Answer:</p> <p>[67] <math>\frac{1}{2(a^2 - b^2)} \log \left  \frac{x^2 + b^2}{x^2 + a^2} \right </math></p>	<p>Answer:</p> <p>[68] <math>\log \left  \frac{x(x-1)^2}{(x+1)^2} \right </math></p>	<p>Answer:</p> <p>[69] <math>- \tan^{-1} x + \sqrt{2} \tan^{-1} \frac{x}{\sqrt{2}}</math></p>
<p>Answer:</p> <p>[70] <math>-e^{-\frac{x}{2}} \sec \frac{x}{2}</math></p>	<p>Answer:</p> <p>[71] <math>\frac{1}{3} \log \left  \frac{x^3}{x^3 + 1} \right </math></p>	<p>Answer:</p> <p>[72] <math>\frac{1}{8} \log \left  \frac{\sin x - 1}{\sin x + 1} \right  - \frac{1}{4\sqrt{2}} \log \left  \frac{\sqrt{2} \sin x - 1}{\sqrt{2} \sin x + 1} \right </math></p>
<p>Answer:</p> <p>[73] <math>-\frac{1}{2} \log(1 + \sin x) - \frac{1}{6} \log(1 - \sin x) + \frac{2}{3} \log 1 + 2 \sin x </math></p>		

Answer:

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

Answer:

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

Answer:

$$[76] -2a(a-x)^{\frac{3}{2}} + \frac{2}{3}(a-x)^{\frac{5}{2}}$$

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

$$[88] 6\sqrt{x^2 - 9x + 20} + 34 \log \left| x - \frac{9}{2} + \sqrt{x^2 - 9x + 20} \right|$$

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

$$[101] - \frac{3x}{2} + \frac{35}{36} \log \left| 9e^{2x} - 4 \right|$$

Answer:

$$[102] \frac{2}{3} \left[ \frac{(1-a) \log |1 - \sqrt{ax}| + (a-2)(1 - \sqrt{ax}) + \frac{1}{2}(1 - \sqrt{ax})^2}{a^2} \right]$$

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

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

Answer:

$$[121]$$

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

Answer:

$$[122]$$

$$\frac{18x}{25} + \frac{2}{25} \log |4 \cos x + 3 \sin x|$$

Answer:

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

Answer:

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

Answer:

$$[125]$$

$$- \sqrt{(\beta - x)(x - \alpha)} - (\beta - \alpha) \sin^{-1} \sqrt{\frac{\beta - x}{\beta - \alpha}}$$

Answer:

$$[126]$$

$$\frac{\sqrt{5}}{2} \tan^{-1} \left( \frac{2 \tan x}{\sqrt{5}} \right) - x$$

Answer:

$$[127]$$

$$\frac{x}{2} + \frac{1}{4\sqrt{2}} \log \left| \frac{\sqrt{2} + \sin 2x}{\sqrt{2} - \sin 2x} \right|$$

Answer:

$$[128]$$

$$x \log \log |x| - \frac{x}{\log x}$$

Answer:

$$[129]$$

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

Answer:

$$[130]$$

$$\frac{1}{5} \log \left| \frac{\tan x - 2}{2 \tan x + 1} \right|$$

Answer:

$$[131]$$

$$x \cot^{-1} (1 - x + x^2) + \frac{1}{2} \log \left| \frac{x^2 - 2x + 2}{x^2 + 1} \right| + \tan^{-1} (x - 1)$$

Answer:

$$[132]$$

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

Answer:

$$[133]$$

$$\frac{x^2}{2} (\tan^{-1} x)^2 - x \tan^{-1} x + \log |\sec(\tan^{-1} x)| + \frac{1}{2} (\tan^{-1} x)^2$$

Answer:

$$[134]$$

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

Answer:

$$[135]$$

$$x + \frac{1}{2} \log |x - 1| - 8 \log |x - 2| + \frac{27}{2} \log |x - 3|$$

Answer:

$$[136]$$

$$\operatorname{cosec}^{-1} (1 + \sin 2x)$$

Answer:

$$[137]$$

$$\frac{1}{\sqrt{2}} \log \left| \frac{\sqrt{2} + \sqrt{1 - \tan^2 x}}{\sqrt{2} - \sqrt{1 - \tan^2 x}} \right| - \frac{1}{2} \log \left| \frac{1 + \sqrt{1 - \tan^2 x}}{1 - \sqrt{1 - \tan^2 x}} \right|$$