

1) Find the area of the region enclosed by  $y = x^2$  and  $y = x + 6$ .

2) Evaluate  $\int (\sin x)^5 (\cos x)^2 dx$ .

3) Show that,

$$\int (\sin x)^n dx = -\frac{1}{n} (\sin x)^{n-1} \cos x + \frac{(n-1)}{n} \int (\sin x)^{n-2} dx,$$

$n \in N$ .

4) Evaluate  $\int \frac{x^2}{\sqrt{9-x^2}} dx$ .

5) Find the volume of the solid obtained when the region under the curve  $y = \sqrt{x}$  over the interval  $[1,4]$  is revolved about the  $x$ -axis.

6) Evaluate  $\int \frac{5x-10}{x^2-3x-4} dx$ .

7) Evaluate  $\int_0^6 f(x) dx$  if,  $f(x) = \begin{cases} x^2, & x \leq 2 \\ 3x - 2, & x \geq 2 \end{cases}$

8) Evaluate  $\int \frac{1}{1-\sin x + \cos x} dx$ .

9) Find the area of the region enclosed by  $y = x^2 - 2x + 3$ ,  
 $x$ -axis,  $x = 0$  and  $x = 3$ .

10) Evaluate  $\int (\sin x)^3 dx$ .

11) Show that,  $\int (\cos x)^n dx = \frac{1}{n} (\cos x)^{n-1} \sin x +$

$(n-1) \int (\cos x)^{n-2} dx, n \in \mathbb{N}.$

12) Evaluate  $\int \frac{x^3}{(3+x^2)^{\frac{5}{2}}} dx.$

13) Find the volume of the solid generated when the region enclosed by  $y = \frac{1}{2} + x^2$ ,  $y = x$ ,  $x = 0$  and  $x = 2$  is revolved about  $x$ -axis.

14) Find  $\int \frac{2x+4}{x^3-2x^2} dx.$

15) Evaluate  $\int_0^2 2x(x^2 + 1)^3 dx.$

16) Find  $\int \frac{1}{\sin x + \tan x} dx$ .

17) Find the area of the region enclosed by  $y = x^3$  and  $y = x$ .

18) Evaluate  $\int (\sin x)^{\frac{2}{5}} (\cos x)^3 dx$ .

19) Evaluate  $\int \frac{\sqrt{9x^2-1}}{x} dx$ .

20) Find  $\int \sin \sqrt{x} dx$ .

21) Find the volume of the solid generated when the region enclosed by  $y = \sqrt{x}$ ,  $y = 2$ , and  $x = 0$  is revolved about the  $y$ -axis.

22) Find  $\int \frac{x^3+x^2+x+2}{x^4+3x^2+2} dx$ .

23) Evaluate  $\int_0^{\frac{\pi}{8}} (\sin 2x)^5 \cos 2x dx$

24) Find  $\int \frac{1}{1-\cos x} dx$ .

25) Show that,  $\int (\sin x)^n dx = -\frac{1}{n} (\sin x)^{n-1} \cos x +$

$(n-1) \int (\sin x)^{n-2} dx, n \in \mathbb{N}$ .

26) Evaluate  $\int \sin x \cos 2x \, dx$ .

27) Evaluate  $\int \frac{1}{\sqrt{2x-x^2}} \, dx$ .

28) Evaluate  $\int \frac{x^3}{x^2-3x+2} \, dx$ .

29) Evaluate  $\int \frac{1}{1-\sin x + \cos x} \, dx$ .

30) Evaluate  $\int_0^2 2x(x^2 + 1)^3 \, dx$ .

31) Find the area of the region enclosed by  $y = x^2$  and  $y = x + 6$ .

32) Find the volume of the solid obtained when the region under the curve  $y = \sqrt{x}$  over the interval  $[1,4]$  is revolved about the  $x$  -axis.

33) Find  $\int \sin \sqrt{x} dx$ .

34) Show that,  $\int (\cos x)^n dx = \frac{1}{n} (\cos x)^{n-1} \sin x + (n-1) \int (\cos x)^{n-2} dx, n \in \mathbb{N}$ .

35) Evaluate  $\int \cos 3x \cos 2x dx$ .

36) Evaluate  $\int \frac{1}{\sqrt{x^2-6x+10}} dx$ .

37) Evaluate  $\int \frac{x^5+2x^2+1}{x^3-x} dx.$

38) Find  $\int \frac{1}{\sin x + \tan x} dx.$

39) Evaluate  $\int_0^{\frac{\pi}{8}} (\sin 2x)^5 \cos 2x dx.$

40) Find the area of the region enclosed by  $y = x^2 - 2x + 3$ ,  
 $x$ -axis,  $x = 0$  and  $x = 3$ .

41) Find the volume of the solid generated when the region  
enclosed by  $y = \frac{1}{2} + x^2$ ,  $y = x$ ,  $x = 0$  and  $x = 2$  is revolved about  
 $x$ -axis.



42) Find  $\int \cos \sqrt{x} dx$ .

43) Evaluate  $\int e^x \cos x dx$ .

44) Evaluate  $\int \cos 5x \cos 3x dx$ .

45) Evaluate  $\int \frac{1}{\sqrt{4x-x^2}} dx$ .

46) Evaluate  $\int \frac{x^3-3x^2+2x-3}{x^2+1} dx$ .

47) Find  $\int \frac{1}{1-\cos x} dx$ .

48) Evaluate  $\int_{-1}^2 |x| dx$ .

49) Find the area of the region enclosed by  $y = x^3$  and  $y = x$

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50) Find the volume of the solid generated when the region enclosed by  $y = \sqrt{x}$ ,  $y = 2$ , and  $x = 0$  is revolved about the  $y$ -axis.

51) Find  $\int e^{\sqrt{x}} dx$ .

52) Show that,  $\int (\sin x)^n dx = -\frac{1}{n} (\sin x)^{n-1} \cos x +$

$(n-1) \int (\sin x)^{n-2} dx, n \in \mathbb{N}.$

53) Evaluate  $\int \sin x \cos 2x \, dx$ .

54) Evaluate  $\int \frac{1}{\sqrt{2x-x^2}} \, dx$ .

55) Evaluate  $\int \frac{x^3}{x^2-3x+2} \, dx$ .

56) Evaluate  $\int \frac{1}{1-\sin x + \cos x} \, dx$ .

57) Evaluate  $\int_0^2 2x(x^2 + 1)^3 \, dx$ .

58) Find the area of the region enclosed by  $y = x^2$  and  $y = x + 6$ .

59) Find the volume of the solid obtained when the region under the curve  $y = \sqrt{x}$  over the interval  $[1,4]$  is revolved about the  $x$ -axis.

60) Find  $\int \sin \sqrt{x} dx$ .

61) Evaluate  $\int \cos 3x \cos 2x dx$ .

62) Evaluate  $\int \frac{1}{\sqrt{x^2-6x+10}} dx$ .

63) Evaluate  $\int \frac{x^5+2x^2+1}{x^3-x} dx$ .

64) Find  $\int \frac{1}{\sin x + \tan x} dx$ .

65) Evaluate  $\int_0^{\frac{\pi}{8}} (\sin 2x)^5 \cos 2x dx$ .

66) Find the area of the region enclosed by  $y = x^2 - 2x + 3$ ,  
 $x$ -axis,  $x = 0$  and  $x = 3$ .

67) Find the volume of the solid generated when the region enclosed  
by  $y = \frac{1}{2} + x^2$ ,  $y = x$ ,  $x = 0$  and  $x = 2$  is revolved about  $x$ -axis.

68) Find  $\int \cos \sqrt{x} dx$ .

69) Evaluate  $\int e^x \cos x dx$ .

70) Evaluate  $\int \cos 5x \cos 3x \, dx$ .

71) Evaluate  $\int \frac{1}{\sqrt{4x-x^2}} \, dx$ .

72) Evaluate  $\int \frac{x^3-3x^2+2x-3}{x^2+1} \, dx$ .

73) Find  $\int \frac{1}{1-\cos x} \, dx$ .

74) Evaluate  $\int_{-1}^2 |x| \, dx$ .

75) Find the area of the region enclosed by  $y = x^3$  and  $y = x$ .

76) Find the volume of the solid generated when the region enclosed by  $y = \sqrt{x}$ ,  $y = 2$ , and  $x = 0$  is revolved about the  $y$ -axis.

77) Find  $\int e^{\sqrt{x}} dx$ .

78) Evaluate  $\int \frac{(\sec x)^2}{\sqrt{1-(\tan x)^2}} dx$ .

79) Evaluate  $\int \sin x \cos 2x dx$ .

80) Evaluate  $\int \frac{dx}{(9x^2-1)^{\frac{3}{2}}}$ .

81) Evaluate  $\int \frac{x}{x^2-4x+8} dx$ .

82) Evaluate  $\int \frac{x^3 - 3x^2 + 2x - 3}{x^2 + 1} dx$ .

83) Find  $\int x \sqrt{x - 2} dx$ .

84) Find  $\int \frac{dx}{1 - \sin x + \cos x}$ .

85) Find the area of the region enclosed by  $y^2 = x$  and  $y = x - 2$ ,  
integrating with respect to  $y$ .

86) Find the volume of the solid generated when the region enclosed  
by  $y = \frac{1}{2} + x^2$ ,  $y = x$ ,  $x = 0$  and  $x = 2$  is revolved about the  $x$ -axis.

87) Evaluate a)  $\int_0^1 f(x) dx$  b)  $\int_{-1}^1 f(x) dx$ , where  $f(x) = \begin{cases} 2x, & x \leq 1 \\ 2, & x > 1 \end{cases}$ .



88) Evaluate  $\int \frac{e^{-x}}{\sqrt{1-e^{-2x}}} dx.$

89) Evaluate  $\int \cos 3x \cos 2x dx.$

90) Evaluate  $\int \frac{\sqrt{1+x^2}}{x} dx .$

91) Evaluate  $\int \frac{dx}{\sqrt{8+2x-x^2}} .$

92) Evaluate  $\int \frac{x^3+3x^2+x+9}{(x^2+1)(x^2+3)} dx.$

93) Find  $\int \frac{\sqrt{x-4}}{x} dx .$

94) Find  $\int \frac{dx}{\sin x + \tan x}$  .

95) Find the area of the region enclosed by  $y = x^2$  and  $y = 4x$  by integrating with respect to  $x$ .

96) Find the volume of the solid generated when the region enclosed by  $y = \sqrt{x}$ ,  $y = 2$  and  $x = 0$  is revolved about the  $y$ -axis.

97) Find  $\int_{-2}^2 \frac{x^3 - 9}{|x| + 1} dx$  .

98) Find  $\int e^{2x} \cos 3x dx$ .

99) Evaluate  $\int \frac{dx}{x\sqrt{1 - (\ln x)^2}}$  .

100) Evaluate  $\int \sin 3x \sin 2x dx$ .

101) Evaluate  $\int \frac{x^3}{\sqrt{2-x^2}} dx$  .

102) Evaluate  $\int \frac{dx}{\sqrt{x^2-6x+1}}$  .

103) Evaluate  $\int \frac{2x^2-1}{(4x-1)(x^2+1)} dx$ .

104) Find  $\int x^5 \sqrt{x^3 + 1} dx$  .

105) Find  $\int \frac{dx}{1-\cos x}$  .

106) Find the area of the region enclosed by  $y = x^2$  and  $y = 4x$  by integrating with respect to  $y$ .

107) Find the volume of the solid obtained when the region under the curve  $y = \sqrt{x}$  over the interval  $[1,4]$  is revolved about the  $x$ -axis.

108) Evaluate  $\int_{-1}^2 \sqrt{2 + |x|} dx$  .

109) Evaluate  $\int \frac{(\sec x)^2}{\sqrt{1 - (\tan x)^2}} dx$ .

110) Evaluate  $\int e^{\sqrt{x}} dx$ .

111) Evaluate  $\int (\sin 2x)^2 (\cos 2x)^3 dx$ .

112) Evaluate  $\int \sqrt{4 - x^2} dx$  .

113) Find  $\int \frac{dx}{\sqrt{2x - x^2}}$  .

114) Evaluate  $\int \frac{x^2 + 2}{x + 2} dx$ .

115) Find  $\int \frac{dx}{2+\sin x}$  .

116) Find  $\int x\sqrt{x-2} dx$  .

117) Evaluate  $\int_{-2}^2 (1 - 3|x|)dx$  .

118) Find the area of the region enclosed by  $y = x^3$ ,  $x$ - axis ,  $x = 1$  and  $x = 3$  .

119) Find the volume of the solid generated when the region enclosed by  $y = x^2$ ,  $x = 0$ ,  $x = 2$  and  $y = 0$  is revolved about the  $x$ -axis.

120) Show that  $\int_1^{\infty} e^{-x} dx$  is converge or diverge.

121) Evaluate  $\int \frac{\cos x}{\sin x \sqrt{(\sin x)^2 - 1}} dx$ .

122) Evaluate  $\int \cos \sqrt{x} dx$ .

123) Evaluate  $\int (\sin 2x)^3 (\cos 2x)^2 dx$ .

124) Evaluate  $\int \frac{\sqrt{1+x^2}}{x} dx$  .

125) Find  $\int \frac{dx}{\sqrt{x^2-6x+10}}$  .

126) Evaluate  $\int \frac{x^3}{x^2-3x+2} dx$ .

127) Find  $\int \frac{dx}{1+\sin x+\cos x}$  .

128) Find  $\int \frac{x}{\sqrt{x+1}} dx$  .

129) Evaluate  $\int_0^2 |2x - 3| dx$  .

130) Find the area of the region enclosed by  $y = 4 - x^2$  and  $x$ - axis .

131) Find the volume of the solid generated when the region enclosed by  $y = x^2$  and  $y = x^3$  is revolved about the  $x$ -axis.

132) Show that  $\int_0^{\infty} e^{-x} dx$  is converge or diverge.

133) Evaluate  $\int \frac{\sin x dx}{\sqrt{1+(\cos x)^2}}$  .

134) Evaluate  $\int \sin \sqrt{x} dx$ .

135) Evaluate  $\int (\sin x)^2 (\cos x)^2 dx$ .

136) Evaluate  $\int \frac{\sqrt{x^2-9}}{x} dx$  .

137) Find  $\int \sqrt{3-2x-x^2} dx$ .

138) Evaluate  $\int \frac{x^3-3x^2+2x-3}{x^2+1} dx$ .

139) Find  $\int \frac{dx}{1-\sin x}$  .

140) Find  $\int \frac{dx}{\sqrt{1+e^x}}$  .

141) Evaluate  $\int_{-1}^2 \sqrt{2+|x|} dx$  .

142) Find the area of the region enclosed by  $y = x^2 - 5$ ,  $x$ - axis ,  
 $x = -1$  and  $x = 2$  .

143) Find the volume of the solid generated when the region enclosed by  $y = 9 - x^2$  and  $y = 0$  is revolved about the  $x$ -axis.

144) Show that  $\int_{-1}^{\infty} \frac{x}{1+x^2} dx$  is converge or diverge.