MATHS

NCERT - NCERT MATHEMATICS(ENGLISH)

INTEGRALS

Exercise 7 9

1. Evaluate the definite integrals $\int_0^1 \frac{2x+3}{5x^2+1}dx$

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2. Evaluate the definite integrals $\int_0^1 xe^{x^2}dx$

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3. Evaluate the definite integrals $\int 12 \frac{5x^2}{x^2+4x+3}$

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4. Evaluate the definite integrals

$$\frac{1}{4} \cdot \int_0^{\pi} \left(2\sec^2 x + x^3 + 2\right) dx$$

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5. Evaluate the definite integrals $\int_0^1 \frac{dx}{1-x^2}$

A. $\frac{\pi}{4}$

B. $\frac{\pi}{2}$

C. $\frac{\pi}{3}$

D. 0

Answer: B

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6. Evaluate the definite integrals $\int_2^3 \frac{dx}{x^2-1}$

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7. Evaluate the definite integrals $\int_0^{\frac{\pi}{2}} \cos^2 x dx$

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8. Evaluate the definite integrals $\int_2^3 \frac{xdx}{x^2+1}$

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9. Evaluate the definite integrals $\int_0^{\pi} \left(\sin^2\left(\frac{x}{2}\right) - \cos^2\left(\frac{x}{2}\right)\right) dx$

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10. $\int_0^2 \frac{6x+3}{x^2+4}dx$

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11. Choose the correct answer $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$ equals(A) $\frac{\pi}{3}$ (B) $\frac{2\pi}{3}$ (C) $\frac{\pi}{6}$ (D) $\frac{\pi}{12}$

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12. Evaluate the definite integrals $\int_0^1 \left(xe^x + \frac{\sin(\pi x)}{4}\right)dx$

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13. Choose the correct answer $\int_0^{\frac{2}{3}} \frac{dx}{4+9x^2}$ (A) $\frac{\pi}{6}$ (B) $\frac{\pi}{12}$ (C) $\frac{\pi}{24}$ (D) $\frac{\pi}{4}$

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14. Evaluate the definite integrals $\int_0^1 \frac{dx}{\sqrt{1-x^2}}$

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15. Evaluate the definite integrals $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} \cos ecx dx$

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16. Evaluate the definite integrals $\int_1^2 \left(4x^3 - 5x^2 + 6x + 9\right) dx$

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17. Evaluate the definite integrals $\int_2^3 \frac{1}{x} dx$

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18. Evaluate the definite integrals $\int -11(x+1) dx$

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19. Evaluate the definite integrals $\int_0^{\frac{\pi}{4}} (\tan x) dx$

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20. Evaluate the definite integrals $\int 45e^x dx$

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21. Evaluate the definite integrals $\int_0^{\frac{\pi}{2}} \cos 2x dx$

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22. Evaluate the definite integrals $\int 0\frac{\pi}{4}\sin 2x dx$

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Exercise 7 6

1. Integrate the functions$x \log 2x$

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2. Integrate the functions$x^2 \log x$

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3. Integrate the functions$x \sin^{-1} x$

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4. Integrate the functions $f(x)$

$f(x) = x \log(x)$

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5. Integrate the functions

$x \cdot \sin x$

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6. Integrate the functions $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$

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7. Choose the correct answer $\int x^2 e^{x^3} dx$ equals (A) $\frac{1}{3}e^{x^3} + C$ (B) $\frac{1}{3}e^{x^2} + C$ (C) $\frac{1}{2}e^{x^3} + C$ (D) $\frac{1}{2}e^{x^2} + C$

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8. Integrate the functions $\frac{(x-3)e^x}{(x-1)^3}$

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9. Integrate the functions $e^{2x} \sin x$

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10. Integrate the functions $e^x \left(\frac{1}{x} - \frac{1}{x^2} \right)$

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11. Evaluate: $\int e^x \left(\frac{1 + \sin x}{1 + \cos x} \right) dx$

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12. Integrate the functions $\left(x^2 + 1\right) \log x$

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13. Integrate the functions $x(\log x)^2$

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14. Integrate the functions $\frac{xe^x}{(1+x)^2}$

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15. Integrate the functions $e^x(\sin x + \cos x)$

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16. Integrate the functions $\frac{x\cos^{-1}x}{\sqrt{1-x^2}}$

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17. Integrate the functions $\left(\sin^{-1}x\right)^2$

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18. Integrate the functions $\tan^{-1} x$

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19. Integrate the function $x \sec^2 x$

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20. Integrate the functions$x \tan^{-1} x$

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21. Integrate the functions $x \cos^{-1} x$

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22. Integrate the functions$x \sin 3x$

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23. Integrate the functions$x^2 e^x$

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24. Choose the correct answer $\int e^x \sec x(1 + \tan x)dx$(A) $e^x \cos x + C$ (B) $e^x \sec x + C$ (C) $e^x \sin x + C$ (D) $e^x \tan x + C$

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Exercise 7 10

1. Evaluate the integrals $\int_0^{\frac{\pi}{2}} \frac{\sin x}{1 + \cos^2 x} dx$

A. $\frac{\pi}{4}$

B. 0

C. $\frac{\pi}{2}$

D. None of these

Answer: A

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2. Evaluate the integrals $\int_{-1}^{1} \frac{dx}{x^2+2x+5}$

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3. Evaluate the integrals $\int_{0}^{2} \frac{dx}{x+4-x^2}$

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4. Evaluate: $\int_0^1 \sin^{-1}\left(\frac{2x}{1+x^2}\right)dx$

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5. The value of the integral

$\int_{1/3}^{1} \frac{(x-x^3)^{1/3}}{x^4}dx$ is

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6. Evaluate the integrals $\int_0^2 x\sqrt{x+2}$

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7. Choose the correct answerIf $f(x) = \int_0^x t\sin t dt$, then $f'(x)$is(A) $\cos x + x\sin x$ (B) $x\sin x$ (C) $x\cos x$ (D) $\sin x + x\cos x$

A. (A) $\cos x + x\sin x$

B. (B) $x \sin x$

C. (C) $x \cos x$

D. (D) $\sin x + x \cos x$

Answer: B

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8. Evaluate the integrals $\int_0^1 \frac{x}{x^2+1} dx$

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9. Evaluate the integrals $\int_0^{\frac{\pi}{2}} \sqrt{\sin \phi} \cos^5 \phi d\phi$

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10. Evaluate the following definite integral: $\int_1^2 e^{2x} \left(\frac{1}{x} - \frac{1}{2x^2} \right) dx$

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Exercise 7 7

1. Integrate the functions $\sqrt{x^2+4x+6}$

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2. $\sqrt{1-4x-x^2}$

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3. Integrate the functions $\sqrt{x^2+4x+1}$

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4. Integrate the functions $\sqrt{1+3x-x^2}$

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5. Integrate the functions $\sqrt{x^2+4x-5}$

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6. Integrate the functions $\sqrt{4-x^2}$

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7. Integrate the functions $\sqrt{1-4x^2}$

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8. Integrate the functions $\sqrt{1+\frac{x^2}{9}}$

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9. Integrate the functions $\sqrt{x^2+3x}$

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10. Choose the correct answer $\int \sqrt{1+x^2}dx$ is equal to(A) $\frac{x}{2}\sqrt{1+x^2}+\frac{1}{2}\log\left|\left(x+\sqrt{x+x^2}\right)\right|+C$ (B) $\frac{2}{3}\left(1+x^2\right)^{\frac{3}{2}}+C$ (C) $\frac{2}{3}x\left(1+x^2\right)^{\frac{3}{2}}+C$ (D) $\frac{x^2}{2}\sqrt{1+x^2}+\frac{1}{2}x^2\log\left|x+\sqrt{1+x^2}\right|+C$

A. $\frac{x}{2}\sqrt{1+x^2}+\frac{1}{2}\log\left|\left(x+\sqrt{x+x^2}\right)\right|+C$

B. $\frac{2}{3}\left(1+x^2\right)^{\frac{3}{2}}+C$

C. $\frac{2}{3}x\left(1+x^2\right)^{\frac{3}{2}}+C$

D. $\frac{x^2}{2}\sqrt{1+x^2}+\frac{1}{2}x^2\log\left|x+\sqrt{1+x^2}\right|+C$

Answer: A

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11. Choose the correct answer $\int \sqrt{x^2-8x+7}dx$(A)1/2(x-4)sqrt(x^2-8x+7)+9log|x-4+sqrt(x^2-8x+7)|+C(B)1/2(x+4)sqrt(x^2-8x+7)+9log|x+4+sqrt(x^2-8x+7)|+C(C)1/2(x-4)sqrt(x^2-8x+7)-3sqrt(2)log|x-4+sqrt(x^2-8x+7)|+C(D)1/2(x-4)sqrt(x^2-8x+7)-(9/2)log|x-4+sqrt(x^2-8x+7)|+C`

A. $\frac{1}{2}(x-4)\sqrt{x^2-8x+7}+9\log\left|x-4+\sqrt{x^2-8x+7}\right|+C$

B. $\frac{1}{2}(x+4)\sqrt{x^2-8x+7}+9\log\left|x+4+\sqrt{x^2-8x+7}\right|+C$

C. $\frac{1}{2}(x-4)\sqrt{x^2-8x+7}-3\sqrt{2}\log\left|x-4+\sqrt{x^2-8x+7}\right|+C$

D. $\frac{1}{2}(x-4)\sqrt{x^2-8x+7}-\left(\frac{9}{2}\right)\log\left|x-4+\sqrt{x^2-8x+7}\right|+C$

Answer: D

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12. Integrate the function $(x+3)\sqrt{3-4x-x^2}$

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13. Integrate : $\int x\sqrt{x+x^2}dx$

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14. Evaluate: $\int(x+1)\sqrt{2x^2+3}dx$

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Exercise 7 11

1. Choose the correct answerThe value of $\int_0^{\frac{\pi}{2}} \log\left(\frac{4+3\sin x}{4+3\cos x}\right)dx$

(A) 2 (B) $\frac{3}{4}$ (C) 0 (D) -2

A. 2

B. $\frac{3}{4}$

C. 0

D. -2

Answer: C

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2. By using the properties of definite integrals, evaluate the integrals

$$\int_0^{\frac{\pi}{2}} \frac{\sin x - \cos x}{1 + \sin x \cos x} dx$$

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3. By using the properties of definite integrals, evaluate the integrals

$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^7 x dx$$

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4. By using the properties of definite integrals, evaluate the integrals

$$\int_0^{\pi} \frac{x dx}{1 + \sin x}$$

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5. By using the properties of definite integrals, evaluate the integrals $\int_0^{\pi} \log(1+\cos x)dx$

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6. By using the properties of definite integrals, evaluate the integrals $\int_0^{2\pi} \cos^5 x dx$

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7. By using the properties of definite integrals, evaluate the integrals $\int_0^{\frac{\pi}{2}} (2\log\sin x - \log\sin 2x)dx$

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8. By using the properties of definite integrals, evaluate the integrals $\int_0^a \frac{\sqrt{x}}{\sqrt{x}+\sqrt{a-x}}dx$

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9. Choose the correct answerThe Value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \left(x^3 + x\cos x + \tan^5 x + 1\right)dx$is(A) 0 (B) 2 (C) π (D) 1

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10. Show that $\int 0a f(x)g(x)dx = 2\int 0a f(x)dx$ if f and g defined as $f(x) = f(a-x)$ and $g(x) + g(a-x) = 4$

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11. By using the properties of definite integrals, evaluate the integrals $\int_0^4 |x-1|dx$

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12. By using the properties of definite integrals, evaluate the integrals $\int_0^{\frac{\pi}{2}} \cos^2 x dx$

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13. Evaluate : $\int_0^{\frac{\pi}{4}} \log(1+\tan x) dx$.

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14. By using the properties of definite integrals, evaluate the integrals $\int_0^2 x\sqrt{2-x} dx$

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15. By using the properties of definite integrals, evaluate the integrals $\int_2^8 |x-5|dx$ and $\int_{-5}^5 |x+2|dx$

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16. By using the properties of definite integrals, evaluate the integrals $\int_0^1 x(1-x)^n dx$

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17. By using the properties of definite integrals, evaluate the integrals $\int_0^{\frac{\pi}{2}} \frac{\cos^5 x dx}{\sin^5 + \cos^5 x}$

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18. By using the properties of definite integrals, evaluate the integrals $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$

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19. By using the properties of definite integrals, evaluate the integrals

$$\int_0^{\frac{\pi}{2}} \frac{\sin^{\frac{3}{2}} x dx}{\sin^{\frac{3}{2}} + \cos^{\frac{3}{2}} x}$$

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20. By using the properties of definite integrals, evaluate the integrals

$$\int_{-5}^{5} |x+2| dx$$

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Exercise 7 5

1. $\int \frac{dx}{x(x^2+1)}$ equal(A) $\log|x| - \frac{1}{2}\log(x^2+1) + C$ (B)

$\log|x| + \frac{1}{2}\log(x^2+1) + C$(C) $-\log|x| + \frac{1}{2}\log(x^2+1) + C$(D)

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

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2. Integrate the rational functions $\frac{1}{x(x^4-1)}$

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3. $\int \frac{xdx}{(x-1)(x-2)}$ equal

(A) $\log\left|\frac{(x-1)^2}{x-2}\right|+C$ (B) $\log\left|\frac{(x-2)^2}{x-1}\right|+C$ (C) $\log\left|\frac{(x-1)^2}{x-2}\right|+C$ (D) $\log|(x-1)(x-2)|+C$

A. $\log\left|\frac{(x-1)^2}{x-2}\right|+C$

B. $\log\left|\frac{(x-2)^2}{x-1}\right|+C$

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

D. $\log|(x-1)(x-2)|+C$

Answer: B

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4. Integrate the rational functions $\frac{1}{(e^x - 1)}$ [Hint : Put $e^x = t$]

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5. Integrate the rational functions $\frac{3x + 5}{x^3 - x^2 - x + 1}$

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6. Integrate the rational functions $\frac{x}{(x - 1)^2(x + 2)}$

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7. Integrate the rational functions $\frac{x}{(x^2 + 1)(x - 1)}$

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8. Integrate the rational functions $\frac{1-x^2}{x(1-2x)}$

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9. Integrate the rational functions $\frac{2x}{x^2+3x+2}$

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10. Integrate the rational functions $\frac{x}{(x-1)(x-2)(x-3)}$

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11. Integrate the rational functions $\frac{3x-1}{(x-1)(x-2)(x-3)}$

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12. Integrate the rational functions $\frac{1}{x^2-9}$

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13. Integrate the rational functions $\frac{x}{(x+1)(x+2)}$

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14. Integrate the rational functions $\frac{(x^2+1)(x^2+2)}{(x^2+3)(x^2+4)}$

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15. Integrate the rational functions $\frac{2x}{(x^2+1)(x^2+3)}$

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16. Integrate the rational functions $\frac{2x-3}{(x^2-1)(2x-4)}$

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17. Integrate the rational functions $\frac{5x}{(x+1)(x^2-4)}$

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18. Integrate the rational functions $\frac{x^3+x+1}{x^2-1}$

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19. Integrate the rational functions $\frac{2}{(1-x)(1+x^2)}$

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20. Integrate the rational functions $\frac{3x-1}{(x+2)^2}$

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21. Integrate the rational functions $\frac{1}{x^4-1}$

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22. Integrate the rational functions $\frac{1}{x(x^n+1)}$ [Hint: multiply numerator and denominator by x^{n-1} and put $x^n = t$]

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23. Integrate the rational functions $\frac{\cos x}{(1-\sin x)(2-\sin x)}$ [Hint: Put $\sin x = t$]

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Miscellaneous Exercise

1. Integrate the functions $\frac{x^3}{\sqrt{1-x^8}}$ dx

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2. Integrate the functions $\cos^3 x e^{\log \sin x}$

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3. Integrate the functions $\frac{1}{\cos(x+a)\cos(x+b)}$dx

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4. Integrate the functions $\frac{\sin^8 x - \cos^8 x}{1 - 2\sin^2 x \cos^2 x}$

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5. Integrate the functions $\frac{\cos x}{\sqrt{4 - \sin^2 x}}$

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6. Integrate the functions $\frac{e^{5\log x} - e^{4\log x}}{e^{2\log x} - e^{2\log x}}$

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7. Integrate the functions $\frac{1}{x - x^3}$

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8. Integrate the functions $e^{3\log x}\left(x^4 + 1\right)^{-1}$

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9. Integrate the functions $\frac{1}{x\sqrt{ax - x}}$

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10. Integrate the functions $\frac{1}{\sqrt{\sin^3 x \sin(x+\alpha)}}$

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11. Find : $\int \frac{\sin^{-1}\sqrt{x} - \cos^{-1}\sqrt{x}}{\sin^{-1}\sqrt{x} + \cos^{-1}\sqrt{x}} dx, x \in [0, 1]$

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12. Prove that $\int_{-1}^{1} x^{17} \cos^4 x dx = 0$

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13. Prove that $\int_0^1 \sin^{-1} x dx = \frac{\pi}{2} - 1$

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14. Integrate the functions $\frac{5x}{(x+1)(x^2+9)}$

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15. Integrate the functions $\frac{1}{(x^2+1)(x^2+4)}$

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16. Integrate the functions $\frac{e^x}{(1+e^x)(2+e^x)}$

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17. Integrate the functions $\frac{1}{\sqrt{x+a}+\sqrt{x+b}}$

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18. Evaluate the definite integrals $\int_0^1 \frac{dx}{\sqrt{1+x}-\sqrt{x}}$

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19. Evaluate the definite integrals $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\sin x+\cos x}{\sqrt{\sin 2x}}dx$

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20. Evaluate the definite integrals $\int_0^{\frac{\pi}{2}} \frac{\cos^2 x dx}{\cos^2 x+4\sin^2 x}$

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21. Evaluate the definite integrals $\int_0^{\frac{\pi}{4}} \frac{\sin x \cos x}{\cos^4 x+\sin^4 x}dx$

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22. Evaluate the definite integrals $\int_{\frac{\pi}{2}}^{\pi} e^x \left(\frac{1-\sin x}{1-\cos x} \right) dx$

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23. $\frac{\sqrt{x^2+1}\left[\log\left(x^2+1\right)-2\log x\right]}{x^4}$

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24. Integrate the functions$\tan^{-1}\sqrt{\frac{1-x}{1+x}}$

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25. Integrate the functions $\frac{x^2+x+1}{(x+1)^2(x+2)}$

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26. Integrate the functions $\frac{2+\sin 2x}{1+\cos 2x}e^x$

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27. Integrate the functions $\sqrt{\frac{1-\sqrt{x}}{1+\sqrt{x}}}$

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28. Evaluate the definite integrals $\int_0^{\frac{\pi}{4}} \frac{\sin x+\cos x}{9+16\sin 2x}dx$

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29. Evaluate the definite integrals $\int_0^{\frac{\pi}{2}} \sin 2x \tan^{-1}(\sin x)dx$

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30. Choose the correct answers $\int \frac{\cos 2x}{(\sin x + \cos x)^2} dx$ is equal(A) $\frac{-1}{\sin x + \cos x} + C$ (B) $\log|\sin x + \cos x| + C$ C) $\log|\sin x - \cos x| + C$ (D) $\frac{1}{(\sin x + \cos x)^2}$

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31. Evaluate the definite integrals $\int_0^{\pi} \frac{x \tan x}{\sec x + \tan x} dx$

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32. Evaluate the definite integrals $\int_1^4 [|x-1| + |x-2| + |x-3|] dx$

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33. Prove that $\int_1^3 \frac{dx}{x^2(x+1)} = \frac{2}{3} + \frac{\log 2}{3}$

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34. Prove that $\int_0^1 xe^x dx = 1$

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35. Prove that $\int_0^{\frac{\pi}{4}} 2\tan^3 x dx = 1 - \log 2$

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36. Prove that $\int_0^{\frac{\pi}{2}} \sin^3 x dx = \frac{2}{3}$

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37. Integrate the functions $\frac{\sin x}{\sin(x-a)}$

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38. Integrate the functions $\frac{1}{x^{\frac{1}{2}}+x^{\frac{1}{3}}}$ [Hint: $\frac{1}{x^{\frac{1}{2}}+x^{\frac{1}{3}}}=\frac{1}{x^{\frac{1}{3}}\left(1+x^{\frac{1}{6}}\right)}$, put $x=t^6$]

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39. Integrate the functions $\frac{1}{x^2(x^4+1)^{\frac{3}{4}}}$

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40. The value of $\int_0^1 \tan^{-1}\left(\frac{2x-1}{1+x-x^2}\right)dx$, is

a. 1

b. -1

c. 0

d. $\pi/4$

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41. Choose the correct answers $\int \frac{dx}{e^x + e^{-x}}$ is equal to (A) $\tan^{-1}(e^x) + C$ (B) $\tan^{-1}(e^{-x}) + C$ (C) $\log(e^x - e^{-x}) + C$ (D) $\log(e^x + e^{-x}) + C$

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42. If $f(a+b-x) = f(x),\ then \int_a^b xf(x)dx$ is equal to

a. $\frac{a+b}{2}\int_a^b f(b-x)dx$

b. $\frac{a+b}{2}\int_a^b f(b+x)dx$

c. $\frac{b-1}{2}\int_a^b f(x)dx$

d. $\frac{a+b}{2}\int_a^b f(x)dx$

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43. Integrate the functions $f'(ax+b)[f(ax+b)]^n$

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44. Evaluate $\int_0^1 e^{2-3x}\,dx$ as a limit of a sum.

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Exercise 7 3

1. Integrate the functions $\frac{\cos 2x + 2\sin^2 x}{\cos^2 x}$

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2. $\frac{1}{\sin x \cos^3 x}$

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3. $\frac{\sin^2 x}{1+\cos x}$

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4. Integrate the functions $\frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha}$

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5. Integrate the functions $\sin^4 x$

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6. Integrate the functions $\cos^4 2x$

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7. Integrate the function $\tan^4 x$

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8. Integrate the functions $\frac{\sin^3 x + \cos^3 x}{\sin^2 x \cos^2 x}$

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9. Integrate the functions $\frac{\cos x - \sin x}{1 + \sin 2x}$

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10. Integrate the functions $\tan^3 2x \sec 2x$

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11. $\int \frac{e^x(1+x)}{\cos^2(e^x \cdot x)} dx$ equals(A) $-\cot(ex^x) + C$ (B) $\tan(xe^x) + C$(C) $\tan(e^x) + C$ (D) $\cot(e^x) + C$

A. (A) $-\cot(e^x \cdot x) + C$

B. (B) $\tan(xe^x) + C$

C. (C) $\tan(e^x) + C$

D. (D) $\cot(e^x) + C$

Answer: B

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12. $\int \frac{\sin^2 x - \cos^2 x}{\sin^2 \cos^2 x} dx$ is equal to (A) $\tan x + \cot x + c$ (B) $\tan x + \cos ecx + c$ (C) $-\tan x + \cot x + c$ (D) $\tan x + \sec x + c$

A. $\tan x + \cot x + c$

B. $\tan x + \cos ecx + c$

C. $-\tan x + \cot x + c$

D. $\tan x + \sec x + c$

Answer: A

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13. Integrate the functions $\frac{1}{\cos(x-a)\cos(x-b)}$ dx

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14. Integrate the functions$\sin^{-1}(\cos x)$

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15. $\frac{\cos 2x}{(\cos x + \sin x)^2} dx$

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16. Find the integrals of the function $\sin^2(2x + 5)$

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17. Integrate the functions $\frac{\cos x}{1 + \cos x}$

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18. Integrate the functions $\frac{1-\cos x}{1+\cos x}$

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19. Find the integrals of the functions $\cos 2x \cos 4x \cos 6x$

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20. Find the integrals of the functions $\sin 3x \cos 4x$

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21. Integrate the functions$\sin^3 x \cos^3 x$

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22. Find the integrals of the functions$\sin^3(2x+1)$

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23. Integrate the functions $\sin 4x \sin 8x$

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24. Integrate the function $\sin x \sin 2x \sin 3x$

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Solved Examples

1. Evaluate $\int_{-1}^{1} 5x^4\sqrt{x^5+1}dx$

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2. Evaluate $\int_{0}^{1} \frac{\tan^{-1} x}{1+x^2}dx$

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3. Find (i) $\int e^x \left(tan^{-1} x + \frac{1}{1+x^2} \right) dx$ (ii) $\int \frac{\left(x^2+1\right) e^x}{\left(1+x\right)^2} \Bigg) dx$

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4. Find $\int \sqrt{x^2 + 2x + 5} dx$

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5. Find $\int \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$

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6. Find $\int e^x \sin x dx$

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7. Evaluate $\int_0^2 e^2 dx$

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8. Evaluate the following integrals:(i) $\int 23x^2 dx$ (ii) $\int 49 \frac{\sqrt{x}}{\left(30 - x^{\frac{3}{2}}\right)^2} dx$ (iii) $\int 12 \frac{x dx}{(x+1)(x+2)}$ (iv) $\int 0 \frac{\pi}{4} \sin^3 2t \cos 2t dt$

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

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10. Find $\int_0^2 \left(x^2 + 1\right) dx$as the limit of a sum.

A. $\frac{14}{3}$

B. $-\frac{14}{3}$

C. $\frac{16}{3}$

D. $-\frac{16}{3}$

Answer: A

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11. Evaluate: $\int_0^{\pi} \frac{x}{a^2\cos^2 x + b^2\sin^2 x}dx$

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12. Evaluate: $\int\left(\log(\log x) + \frac{1}{(\log x)^2}\right)dx$

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13. If $I = \int\left(\sqrt{\cot x} - \sqrt{\tan x}\right)dx,$ then I equals

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14. Find $\int x \cos x dx$

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15. $\int \frac{x^2 + x + 1}{(x+2)(x^2+1)} dx$

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16. Find $\int \frac{(3\sin\varphi - 2)\cos\varphi}{5 - \cos\varphi - 4\sin\varphi} d\varphi$

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

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

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19. Find $\int \frac{dx}{(x+1)(x+2)}$

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20. Find the following integrals:(i) $\int \frac{x+2}{2x^2+6x+5}dx$ (ii) $\int \frac{x+3}{\sqrt{5-4x+x^2}}dx$

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21. Find $\int xe^x dx$

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22. Find $\int \log x dx$

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23. Write an anti derivative for each of the following functions using the method of inspection:(i) cos 2x (ii) $3x^2 + 4x^3$ (iii) $\frac{1}{x}, x \neq 0$

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24. Find the following integrals:(i) $\int \frac{x^3 - 1}{x^3} dx$ (ii) $\int \left(x^{\frac{2}{3}} + 1\right) dx$ (iii) $\int \left(x^{\frac{2}{3}} + 2e^x - \frac{1}{x}\right) dx$

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25. Find the following integrals:(i) $\int (\sin x + \cos x) dx$ (ii) $\int \cos ecx (\cos ecx + \cot x) dx$(iii) $\int \frac{1 - \sin x}{\cos^2 x} dx$

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26. Find the anti derivative F of f defined by $f(x) = 4x^3 - 6$, where $F(0) = 3$

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27. Evaluate : $\int \frac{\tan^4 \sqrt{x} \sec^2 \sqrt{x}}{\sqrt{x}} dx.$

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28. Find the following integrals:(i) $\int \sin^3 x \cos^2 x dx$ (ii) $\int \frac{\sin x}{\sin(x+a)} dx$ (iii) $\int \frac{1}{1+\tan x} dx$

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29. Find (i) $\int \cos^2 x dx$ (ii) $\int \sin 2x \cos 3x dx$ (iii) $\int \sin^3 x dx$

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30. Find the following integrals:(i) $\int \frac{dx}{x^2-16}$ (ii) $\int \frac{dx}{\sqrt{2x-x^2}}$

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31. Find the following integrals :(i) $\int \frac{dx}{x^2-6x+13}$ (ii) $\int \frac{dx}{3x^2+13x-10}$ (iii) $\int \frac{dx}{\sqrt{5x^2-2x}}$

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32. integrate this $\int \frac{x^2+1}{x^2-5x+6}dx$

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33. Evaluate: (i) $(ii)(iii)\int (iv)\frac{1}{v}\left((vi)(vii)x^{(viii)4(ix)}(x)+1\right)(xi)(\xi i)dx(\xi ii)$ (xiv) (ii)

$(xv)(xvi)\int(xvii)\frac{(xviii)(\xi x)x^{(xx)2(xxi)}(xxii)}{xxiii}\Big((xxiv)(\times v)x^{(xxvi)4(xxvii}$

(xxxii) dx (iii) $(iv)(v)\int\sqrt{(vi)(vii)\tan\theta(viii)}(ix)dth\eta(x)$ (xi)

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34. Evaluate : $\int_{-1}^{\frac{3}{2}}|x\sin(\pi x)|dx$

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

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36. Find $\int\frac{\left(x^4-x\right)^{\frac{1}{4}}}{x^5}dx$

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37. Evaluate $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \sin^2 x dx$

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38. Evaluate $\int_{-1}^{2} \left|x^3 - x\right| dx$

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39. Evaluate $\int_{-1}^{1} \sin^5 x \cos^4 x dx$

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40. Evaluate: $\int_{0}^{\pi} \frac{x \sin x}{1 + \cos^2 x} dx$

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41. Evaluate $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{dx}{1+\sqrt{\tan x}}$

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42. Evaluate $\int_0^{\frac{\pi}{2}} \left(\frac{\sin^4 x}{\sin^4 x + \cos^4 x} \right) dx$

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43. Find $\int \cos 6x \sqrt{1+\sin 6x} dx$

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44. Evaluate $\int_0^{\frac{\pi}{2}} \log \sin x dx$

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45. Find $\int x\sqrt{1+x-x^2}dx$

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46. Find : $\int \frac{x+3}{\sqrt{5-4x+x^2}}dx$

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Exercise 7 1

1. Find the integral $\int \frac{x^3+3x+4}{\sqrt{x}}dx$

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2. Find the integral $\int \frac{x^3-x^2+x-1}{x-1}dx$

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3. The anti derivative of $\left(\sqrt{x}+\frac{1}{\sqrt{x}}\right)$ equals(A) $\frac{1}{3}x^{\frac{1}{3}}+2x^{\frac{1}{2}}+C$ (B) $\frac{2}{3}x^{\frac{2}{3}}+\frac{1}{2}x^{2}+C$(C) $\frac{2}{3}x^{\frac{3}{2}}+2x^{\frac{1}{2}}+C$ (D) $\frac{3}{2}x^{\frac{3}{2}}+\frac{1}{2}x^{\frac{1}{2}}+C$

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4. Find the integral $\int\frac{2-3\sin x}{\cos^{2}x}dx$

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5. If $\frac{d}{dx}f(x)=4x^{3}-\frac{3}{x^{4}}$such that $f(2)=0$. Then f(x) is(A) $x^{4}+\frac{1}{x^{3}}-\frac{129}{8}$ (B) $x^{3}+\frac{1}{x^{4}}+\frac{129}{8}$(C) $x^{4}+\frac{1}{x^{3}}+\frac{129}{8}$ (D) $x^{3}+\frac{1}{x^{4}}-\frac{129}{8}$

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6. Find an anti derivative (or integral) of the following functions by the method of inspection.e^{2x}

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7. Find an anti derivative (or integral) of the following functions by the method of inspection.cos 3x

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8. Find an anti derivative (or integral) of the following functions by the method of inspection.sin 2x

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9. Find the integral $\int x^2\left(1-\frac{1}{x^2}\right)dx$

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10. Find the integral $\int\left(4e^{3x}+1\right)dx$

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11. Find an anti derivative (or integral) of the following functions by the method of inspection.$\sin 2x - 4e^{3x}$

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12. Find an anti derivative (or integral) of the following functions by the method of inspection.$(ax + b)^2$

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13. Find the integral $\int (2x^2 + e^x)\, dx$

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14. Find the integral $\int (ax^2 + bx + c)\, dx$

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15. Find the integral $\int \sec x(\sec x + \tan x)dx$

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16. Find the integral $\int \frac{\sec^2 x}{\cos ec^2 x}dx$

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17. Find the integral $\int (1-x)\sqrt{x}dx$

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18. Find the integral $\int \sqrt{x}\left(3x^2 + 2x + 3\right)dx$

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19. Find the integral $\int (2x - 3\cos x + e^x)\,dx$

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20. Find the integral $\int (2x^2 - 3\sin x + 5\sqrt{x})\,dx$

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21. Find the integral $\int \left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)^2 dx$

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22. Find the integral $\int \frac{x^3 + 5x^2 - 4}{x^2}\,dx$

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Exercise 7 8

1. Evaluate the following definite integrals as limit of sums.

$$\int_1^4 (x^2 - x)\,dx$$

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2. Evaluate the following definite integrals as limit of sums. $\int_{-1}^{1} e^x\,dx$

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3. Evaluate the following definite integrals as limit of sums. $\int_a^b x\,dx$

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4. Evaluate the following definite integrals as limit of sums.

$$\int_0^4 (x + e^{2x})\,dx$$

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5. Evaluate the following definite integrals as limit of sums. $\int_0^5 (x+1)dx$

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6. Evaluate the following definite integrals as limit of sums. $\int_2^3 x^2 dx$

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Exercise 7 2

1. Integrate the functions $\frac{x}{\sqrt{x+4}}, x > 0$

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2. Integrate the functions $\frac{1}{x-\sqrt{x}}$

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3. Integrate the functions $\frac{x^2}{(2+3x^3)^3}$

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4. Integrate the functions $\left(x^3-1\right)^{\frac{1}{3}}x^5$

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5. Integrate the functions $\frac{x}{9-4x^2}$

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6. Integrate the functions $\frac{1}{x(\log x)^m}, x>0$

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7. Integrate the functions $\frac{x}{e^{x^2}}$

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8. Integrate the functions $(1).\ \frac{x}{9-4x^2}$ $(2).\ e^{2x+3}$

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9. Integrate the functions $\frac{e^{2x}-1}{e^{2x}+1}$

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10. Integrate the functions $\frac{e^{\tan(-1)x}}{1+x^2}$

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11. Integrate the functions $\frac{(\log x)^2}{x}$

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12. Integrate the functions $\frac{1}{x + x \log x}$

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13. Integrate the functions $\frac{2x}{1 + x^2}$

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14. Integrate the functions $\sqrt{ax + b}$

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15. Integrate the functions $x\sqrt{x + 2}$

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16. Integrate the functions $\sin x \sin(\cos x)$

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17. Integrate the functions $\sin(ax+b)\cos(ax+b)$

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18. Integrate the functions $x\sqrt{1+2x^2}$

Watch Video Solution

19. Integrate the functions $(4x+2)\sqrt{x^2+x+1}$

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20. $\int \frac{dx}{\sin^2 x \cos^2 x}$ equals (A) $\tan x + \cot x + C$ (B) $\tan x - \cot x + C$ (C) $\tan x \cot x + C$ (D) $\tan x - \cot 2x + C$

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21. $\int \frac{10x^9 + 10x^x (\log)_{e^{10}} dx}{x^{10} + 10^x}$ equals (A) $10^x - x^{10} + C$ (B) $10^x + x^{10} + C$ (C) $\left(10^x - x^{10}\right)^{-1} + C$ (D) $\log\left(10^x + x^{10}\right) + C$

A. $10^x - x^{10} + C$

B. $10^x + x^{10} + C$

C. $\left(10^x - x^{10}\right)^{-1} + C$

D. $\log\left(10^x + x^{10}\right) + C$

Answer: D

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22. Integrate the functions $\left(x^3 \frac{\sin\left(\tan^{-1} x^4\right)}{1 + x^8}\right.$

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23. Integrate the functions $\frac{(1+x)(x+\log x)^2}{x}$

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24. Integrate the functions $\frac{(1+\log x)^2}{x}$

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25. Integrate the functions $\frac{\sqrt{\tan x}}{\sin x \cos x}$

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26. Integrate the functions $\frac{1}{1-\tan x}$

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27. Integrate the functions $\frac{1}{1+\cot x}$

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28. Integrate the functions $\frac{\sin x}{(1+\cos x)^2}$

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29. Integrate the functions $\frac{\sin x}{1+\cos x}$

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30. Integrate the functions $\frac{\cos x}{\sqrt{1+\sin x}}$

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31. Integrate the functions $\cot x \log \sin x$

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32. Integrate the functions $\frac{e^{2x} - e^{-2x}}{e^{2x} + e^{-2x}}$

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33. Integrate the functions $\tan^2(2x - 3)$

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34. Integrate the functions $\sec^2(7 - 4x)$

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35. Integrate the functions $(1.\ )(\sec)^2(7 - 4x)(2.\ )\frac{\sin^{-1} x}{\sqrt{1 - x^2}}$

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36. Integrate the functions $\frac{2\cos x - 3\sin x}{6\cos x + 4\sin x}$

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37. Integrate the functions $\frac{1}{\cos^2 x(1-\tan x)^2}$

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38. Integrate the functions $\frac{\cos\sqrt{x}}{\sqrt{x}}$

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39. Integrate the functions $\sqrt{\sin 2x}\cos 2x$

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Exercise 7 4

1. Integrate the functions $\frac{x+3}{x^2-2x+5}$

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2. Integrate the functions $\frac{5x+3}{\sqrt{x^2+4x+10}}$

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3. Integrate the functions $\frac{x+2}{\sqrt{4x-x^2}}$

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4. Integrate the functions $\frac{x+2}{\sqrt{x^2+2x+3}}$

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5. $\int \frac{dx}{x^2+2x+2}$ equals(A) $x\tan^{-1}(x+1)+C$ (B) $\tan^{-1}(x+1)+C$ (C) $(x+1)\tan^{-1}x+C$ (D) $\tan^{-1}x+C$

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6. $\int \frac{dx}{\sqrt{9x-4x^2}}$ equals(A) $\frac{1}{9}\sin^{-1}\left(\frac{9x-8}{8}\right)+C$ (B) $\frac{1}{2}\sin^{-1}\left(\frac{8x-9}{9}\right)+C$ (C) $\frac{1}{3}\sin^{-1}\left(\frac{9x-8}{8}\right)+C$ (D) $\frac{1}{2}\sin^{-1}\left(\frac{9x-8}{9}\right)+C$

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7. Integrate the functions $\frac{1}{\sqrt{7-6x-x^2}}$

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8. Integrate the functions $\frac{x+2}{\sqrt{x^2-1}}$

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9. Integrate the functions $\frac{4x+1}{\sqrt{2x^2+x-3}}$

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10. Integrate the functions $\frac{1}{\sqrt{(x-a)(x-b)}}$

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11. Integrate the functions $\frac{1}{\sqrt{8+3x-x^2}}$

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12. Integrate the functions $\frac{1}{\sqrt{(x-1)(x-2)}}$

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13. Integrate the functions $\frac{1}{9x^2+6x+5}$

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14. Integrate the functions $\frac{1}{\sqrt{x^2+2x+2}}$

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15. Integrate the functions $\frac{6x+7}{\sqrt{(x-5)(x-4)}}$

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16. Integrate the functions $\frac{5x-2}{1+2x+3x^2}$

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17. Integrate the functions $\frac{3x^2}{x^6+1}$

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18. Integrate the functions $\frac{1}{\sqrt{1+4x^2}}$

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19. Integrate the functions $\frac{1}{\sqrt{(2-x)^2+1}}$

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20. Integrate the functions $\frac{1}{\sqrt{9-25x^2}}$

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21. Integrate the functions $\frac{3x}{1+2x^4}$

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22. Integrate the functions $\frac{x^2}{1-x^6}$

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23. Integrate the functions $\frac{x-1}{\sqrt{x^2-1}}$

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24. Integrate the functions $\frac{x^2}{\sqrt{x^6+a^6}}$

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25. Integrate the functions $\frac{\sec^2 x}{\sqrt{\tan^2 x+4}}$

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