MATHS

NCERT - FULL MARKS MATHEMATICS(TAMIL)

INTEGRAL CALCULUS

Exercise 11 1

1. Integrate the with respect to x:

x^{11}

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2. Integrate the with respect to x:

$$\frac{1}{x^7}$$

View Text Solution

3. Integrate the with respect to x:

$$\sqrt[3]{x}^4$$

View Text Solution

4. Integrate the with respect to x:

$$\left(x^5\right)\frac{1}{8}$$

View Text Solution

5. Integrate the with respect to x:

$$\frac{1}{\sin^2 x}$$

View Text Solution

6. Integrate the with respect to x:

$$\frac{\tan x}{\cos x}$$

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7. Integrate the with respect to x:

$$\frac{\cos x}{\sin^2 x}$$

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8. Integrate the with respect to x:

$$\frac{1}{\cos^2 x}$$

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9. Integrate the with respect to x:

$$12^3$$

View Text Solution

10. Integrate the with respect to x:

$$\frac{x^{24}}{x^{25}}$$

View Text Solution

11. Integrate the with respect to x:

e^x

View Text Solution

12. Integrate the with respect to x:

$(1+x^2)^{-1}$

View Text Solution

13. Integrate the with respect to x:

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

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Exercise 11 2

1. Integrate the functions with respect to x:

$$(x+5)^6$$

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2. Integrate the functions with respect to x:

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

View Text Solution

3. Integrate the functions with respect to x:

$$\sqrt{3x+2}$$

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4. Integrate the functions with respect to x:

sin 3x

View Text Solution

5. Integrate the functions with respect to x:

cos (5-11x)

View Text Solution

6. Integrate the functions with respect to x:

$\cos ec^2(5x - 7)$

View Text Solution

7. Integrate the functions with respect to x:

e^{3x-6}

View Text Solution

8. Integrate the functions with respect to x:

e^{8-7x}

View Text Solution

9. Integrate the functions with respect to x:

$$\frac{1}{6-4x}$$

View Text Solution

View Text Solution

10. Integrate the functions with respect to x:

$\sec^2 \frac{x}{5}$

View Text Solution

11. Integrate the functions with respect to x:

$\cos ec(5x+3)\cot(5x+3)$

View Text Solution

12. Integrate the functions with respect to x:

30 sec (2-15x) tan (2-15x)

View Text Solution

View Text Solution

13. Integrate the functions with respect to x:

$$\frac{1}{\sqrt{4x}^2}$$

View Text Solution

14. Integrate the functions with respect to x:

$$\frac{1}{\sqrt{1-81x^2}}$$

View Text Solution

15. Integrate the functions with respect to x:

$$\frac{1}{1+36x^2}$$

View Text Solution

Exercise 11 3

1. Integrate the with respect to x:

$$(x+4)^5 + \frac{5}{(2-5x)^4} - \cos ec^2(3x-1)$$

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2. Integrate the with respect to x:

$$4\cos(5-2x) + 9e^{3x-6} + \frac{24}{6-4x}$$

View Text Solution

3. Integrate the with respect to x:

$$\sec^2 \frac{x}{5} + 18\cos 2x + 10\sec(5x+13)\tan(5x+3)\tan(5x+3)$$

View Text Solution

4. Integrate the with respect to x:

$$\frac{8}{\sqrt{1-(4x)^2}} + \frac{27}{\sqrt{1-9x^2}} - \frac{15}{1+25x^2}\backslash$$

View Text Solution

5. Integrate the with respect to x:

$$\frac{6}{1+(3x+2)^2} - \frac{12}{\sqrt{1-(3-4x)^2}}$$

View Text Solution

6. Integrate the with respect to x:

$$\frac{1}{3}\cos\left(\frac{x}{3}-4\right)+\frac{7}{7x+9}+e^{\frac{x}{5}+3}$$

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Exercise 11 4

1. If f'(x) = 4x -5 and f(2) =1 find f(x).

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2. If f'(x) =$9x^2-6x$ and f(0) = -3 , find f(x) .

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3. If $f''(x) = 12x - 6$ and $f(1) = 30$, $f'(1) = 5$ find $f(x)$.

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4. A ball is thrown vertically upward from the ground with an initial velocity of 39.2 m/sec. If the only force considered is that attributed to the acceleration due to gravity find

(i) how long will it take for the ball to strike the ground ?

(ii) the speed with which will it strike the ground ? and

(iii) how high the ball will rise ?

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5. A wound is healing in such a way that t days since Sunday the area of the wound has been decreasing at a rate of $-\frac{3}{(t+2)^2} cm^2$ per day. If on Monday the area of the wound was 2 cm^2

(i) What was the area of the wound on Sunday ?

(ii) What is the anticipated area of the wound on Thursday if it continues to heal at the same rate ?

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Exercise 11 5

1. Integrate the functions with respect to x :

$$\frac{x^3+4x^2-3x+2}{x^2}$$

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2. Integrate the functions with respect to x :

$$\left(\sqrt{x}+\frac{1}{\sqrt{x}}\right)^2$$

View Text Solution

3. Integrate the functions with respect to x :

(2x-5) (36+4x)

View Text Solution

4. Integrate the functions with respect to x :

$$\cot^2 x+\tan^2 x$$

View Text Solution

5. Integrate the functions with respect to x :

$$\frac{\cos 2x - \cos 2a}{\cos x - \cos a}$$

View Text Solution

6. Integrate the functions with respect to x :

$$\frac{co2x}{\sin^2 x \cos^2 x}$$

View Text Solution

7. Integrate the functions with respect to x :

$$\frac{3 + 4\cos x}{\sin^2 x}$$

View Text Solution

8. Integrate the functions with respect to x :

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

View Text Solution

9. Integrate the functions with respect to x :

$$\frac{\sin 4x}{\sin x}$$

View Text Solution

10. Integrate the functions with respect to x :

$$\cos(3x)\cos 2x$$

View Text Solution

11. Integrate the functions with respect to x :

$\sin^2 5x$

View Text Solution

12. Integrate the functions with respect to x :

$$\frac{1+\cos 4x}{\cot x - \tan x}$$

View Text Solution

13. Integrate the functions with respect to x :

$e^{x \log a} e^x$

View Text Solution

14. Integrate the functions with respect to x :

$$(3x+4)\sqrt{3x+7}$$

View Text Solution

15. Integrate the functions with respect to x :

$$\frac{8^{1+x}+4^{1-x}}{2^x}$$

View Text Solution

16. Integrate the functions with respect to x :

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

View Text Solution

17. Integrate the functions with respect to x :

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

View Text Solution

18. Integrate the functions with respect to x :

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

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19. Integrate the functions with respect to x :

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

View Text Solution

20. Integrate the functions with respect to x :

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

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Exercise 11 6

1. Integrate the with respect to x

$$\frac{x}{\sqrt{1+x^2}}$$

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2. Integrate the with respect to x

$$\frac{x^2}{1+x^6}$$

View Text Solution

3. Integrate the with respect to x

$$\frac{e^x - e^{-x}}{e^x + e^{-x}}$$

View Text Solution

4. Integrate the with respect to x

$$\frac{10x^9 + 10^x \log_e 10}{10^x + x^{10}}$$

View Text Solution

5. Integrate the with respect to x

$$\frac{\sin\sqrt{x}}{\sqrt{x}}$$

View Text Solution

6. Integrate the with respect to x

$$\frac{\cot x}{\log(\sin x)}$$

View Text Solution

7. Integrate the with respect to x

$$\frac{\cos ecx}{\log\left(\tan\frac{x}{2}\right)}$$

View Text Solution

8. Integrate the with respect to x

$$\frac{\sin 2x}{a^2 + b^2 \sin^2 x}$$

View Text Solution

9. Integrate the with respect to x

$$\frac{\sin^{-1} x}{\sqrt{1 - x^2}}$$

View Text Solution

10. Integrate the with respect to x

$$\frac{\sqrt{x}}{1 + \sqrt{x}}$$

View Text Solution

11. Integrate the with respect to x

$$\frac{1}{x \log x \log(\log x)}$$

View Text Solution

12. Integrate the with respect to x

$$\alpha\beta x^{a-1} e^{-\beta x^{\alpha}}$$

View Text Solution

13. Integrate the with respect to x

$$\tan x \sqrt{\sec x}$$

View Text Solution

14. Integrate the with respect to x

$$x(1-x)^{17}$$

View Text Solution

15. Integrate the with respect to x

$$\sin^5 x \cos^3 x$$

View Text Solution

16. Integrate the with respect to x

$$\frac{\cos x}{\cos(x-a)}$$

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Exercise 11 7

1. Integrate the with respect to x:

$9xe^{3x}$

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2. Integrate the with respect to x:

x sin 3x

View Text Solution

3. Integrate the with respect to x:

$25xe^{-5x}$

View Text Solution

4. Integrate the with respect to x:

$x \sec x \tan x$

View Text Solution

5. Integrate the with respect to x:

$x \log x$

View Text Solution

6. Integrate the with respect to x:

$27x^2e^{3x}$

View Text Solution

7. Integrate the with respect to x:

$x^2 \cos x$

View Text Solution

8. Integrate the with respect to x:

$x^3 \sin x$

View Text Solution

9. Integrate the with respect to x:

$$\frac{x \sin^{-1}}{\sqrt{1-x^2}}$$

View Text Solution

10. Integrate the with respect to x:

$$x^5 e^{x^2}$$

View Text Solution

11. Integrate the with respect to x:

$$\tan^{-1}\left(\frac{8x}{1-17x^2}\right)$$

View Text Solution

12. Integrate the with respect to x:

$$\sin^{-1}\left(\frac{2x}{1+x^2}\right)$$

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Exercise 11 8

1. Integrate the with respect to x

$$e^{ax}\cos bx$$

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2. Integrate the with respect to x

$$e^{2x}\sin x$$

View Text Solution

3. Integrate the with respect to x

$e^{-x} \cos 2x$

View Text Solution

4. Integrate the with respect to x

$e^{-3x} \sin 2x$

View Text Solution

5. Integrate the with respect to x

$e^{-4x} \sin 2x$

View Text Solution

6. Integrate the with respect to x

$e^{-3x}\cos x$

View Text Solution

Exercise 11 9

1. Integrate the with respect to x:

$e^{x}(\tan x + \log \sec x)$

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2. Integrate the with respect to x:

$$e^x\left(\frac{x-1}{2x^2}\right)$$

View Text Solution

3. Integrate the with respect to x:

$$e^x \sec x(1+\tan x)$$

View Text Solution

4. Integrate the with respect to x:

$$e^x\left(\frac{2+\sin 2x}{1+\cos 2x}\right)$$

View Text Solution

5. Integrate the with respect to x:

$$e^{\tan-1_x}\left(\frac{1+x+x^2}{1+x^2}\right)$$

View Text Solution

6. Integrate the with respect to x:

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

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Exercise 11 10

1. Find the integrals of the :

$$\frac{1}{4-x^2}$$

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2. Find the integrals of the :

$$\frac{1}{25 - 4x^2}$$

View Text Solution

3. Find the integrals of the :

$$\frac{1}{9x^2 - 4}$$

View Text Solution

4. Find the integrals of the :

$$\frac{1}{6x - 7 - x^2}$$

View Text Solution

5. Find the integrals of the :

$$\frac{1}{(x+1)^2 - 25}$$

View Text Solution

6. Find the integrals of the :

$$\frac{1}{\sqrt{x^2 + 4x + 2}}$$

View Text Solution

7. Find the integrals of the :

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

View Text Solution

8. Find the integrals of the :

$$\frac{1}{\sqrt{x^2-4x+5}}$$

View Text Solution

9. Find the integrals of the :

$$\frac{1}{\sqrt{9+8x-x^2}}$$

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Exercise 11 11

1. Integrate the with respect to x :

$$\frac{2x - 3}{x^2 + 4x - 12}$$

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2. Integrate the with respect to x :

$$\frac{5x - 2}{2 + 2x + x^2}$$

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3. Integrate the with respect to x :

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

View Text Solution

4. Integrate the with respect to x :

$$\frac{2x+1}{\sqrt{9+4x-x^2}}$$

View Text Solution

5. Integrate the with respect to x :

$$\frac{x+2}{\sqrt{x^2-1}}$$

View Text Solution

6. Integrate the with respect to x :

$$\frac{2x+3}{\sqrt{x^2+4x+1}}$$

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Exercise 11 12

1. Integrate the functions with respect to x :

$$\sqrt{x^2+2x+10}$$

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2. Integrate the functions with respect to x :

$$\sqrt{x^2+2x+3}$$

View Text Solution

3. Integrate the functions with respect to x :

$$\sqrt{(6-x)(x-4)}$$

View Text Solution

4. Integrate the functions with respect to x :

$$\sqrt{9-(2x+5)^2}$$

View Text Solution

5. Integrate the functions with respect to x :

$$\sqrt{81-(2x+1)^2}$$

View Text Solution

6. Integrate the functions with respect to x :

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

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Exercise 11 13

1. If $\int$ f(x) dx = g(x) +c , then $\int f(x)g'(x)dx$

A. $f(f(x))^2 dx$

B. $\int$ f(x) g (x) dx

C. $\int f(x)g(x)dx$

D. $\int (g(x))^2 dx$

Answer: A

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2. If $\int \frac{3^{\frac{1}{x}}}{x^2} \mathrm{dx} = \mathrm{k} \left(3^{\frac{1}{x}}\right) + c$ then the value of k is

A. log 3

B. $-\log 3$

C. $-\frac{1}{\log 3}$

D. $-\frac{1}{\log 3}$

Answer: C

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3. If $\int f'(x)e^{x^2}$ dx= $(x-1)^{e^{x^2}}+c$

A. $2x^3-\frac{x^2}{2}+x+c$

B. $\frac{x^3}{2}+3x^2+4x+c$

C. x^3+4x^2+6x+c

D. $\frac{2x^3}{3}-x^2+x+c$

Answer: D

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4. The gradient (slope) of a curve at any point (x, y) is $\frac{x^2-4}{x^2}$. If the curve passes through the point (2,7), then

the equation of the curve is

A. $y = x + \frac{4}{x} + 3$

B. $y = x + \frac{4}{x} + 4$

C. $y = x^2 + 3x + 4$

D. $y = x^2 - 3x + 6$

Answer: A

View Text Solution

5. $\int \frac{x^x(1+x)}{\cos^2(xe^x)}$

A. $\cot(xe^x) + c$

B. $\sec(xe^x) + c$

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

D. $\cos(xe^x) + c$

Answer: C

View Text Solution

6. $\int \frac{\sqrt{\tan x}}{\sin 2x} dx$ is

A. $\sqrt{\tan x} + c$

B. $2\sqrt{\tan x} + c$

C. $\frac{1}{2}\sqrt{\tan x} + c$

D. $\frac{1}{4}\sqrt{\tan x} + c$

Answer: A

View Text Solution

7. $\int \sin^3 x dx$ is

A. $\frac{-3}{4}\cos x - \frac{\cos 3x}{12} + c$

B. $\frac{3}{4}\cos x + \frac{\cos 3x}{12} + c$

C. $\frac{-3}{4}\cos x + \frac{\cos 3x}{12} + c$

D. $\frac{-3}{4}\sin x - \frac{\sin 3x}{12} + c$

Answer: C

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8. $\int \frac{e^{5\log x} - e^{5\log x}}{e^{4\log x} - e^{3\log x}} dx$ is

A. x+c

B. $\frac{x^3}{3}+c$

C. $\frac{3}{x^3}+c$

D. $\frac{1}{x^2}+c$

Answer: B

View Text Solution

9. $\int \frac{\sec x}{\sqrt{\cos 2x}} dx$ is

A. $\tan^{-1}$ (sinx) +c

B. $2\sin^{-1}$ (tan x) +c

C. $\tan^{-1}$ (cos x) +c

D. $\sin^{-1}$ (tan x) +c

Answer: D

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10. $\int \tan^{-1}\sqrt{\frac{1-\cos 2x}{1+\cos 2x}}$ dx is

A. x^2+c

B. $2x^2+c$

C. $\frac{x^2}{2}+c$

D. $-\frac{x^2}{2}+c$

Answer: C

View Text Solution

11. $\int 2^{3x+5}$ dx is

A. $\frac{3(2^{2x+5})}{\log 2} + c$

B. $\frac{2^{3x+5}}{2\log(3x+5)} + c$

C. $\frac{2^{3x+5}}{2\log 3} + c$

D. $\frac{2^{3x+5}}{3\log 2} + c$

Answer: D

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12. $\int \frac{\sin^8 x - \cos^8 x}{1 - 2\sin^2 x \cos^2 x}$dx is

A. $\frac{1}{2}\sin 2x + c$

B. $-\frac{1}{2}\sin 2x + c$

C. $\frac{1}{2}\cos 2x + c$

D. $-\frac{1}{2}\cos 2x + c$

Answer: B

View Text Solution

13. $\int \frac{e^x\left(x^2\tan^{-1}x + \tan^{-1}x + 1\right)}{x^2+1}dx$ is

A. $e^x\tan^{-1}(x+1) + c$

B. $\tan^{-1}(e^x) + c$

C. $e^x\frac{\left(\tan^{-1}x\right)^2}{2} + c$

D. $e^x\tan^{-1}x + c$

Answer: D

View Text Solution

14. $\int \frac{x^2 + \cos^2 x}{x^2 + 1} \cos ec^2$ xdx is

A. $\cot x + \sin^{-1} x + c$

B. $-\cot x + \tan^{-1} x + c$

C. $-\tan x + \cot^{-1} x + c$

D. $-\cot x - \tan^{-1} x + c$

Answer: D

View Text Solution

15. $\int x^2 \cos x dx$ is

A. $x^2 \sin x + 2x \cos x - 2 \sin x + c$

B. $x^2 \sin x - 2x \cos x - 2 \sin x + c$

C. $-x^2$ sin x +2x cos x +2 sin x +c

D. $-x^2$ sinx -2 x cos x +2 sinx +c

Answer: A

View Text Solution

16. $\int \sqrt{\frac{1-x}{1+x}} dx$ is

A. $\sqrt{1-x^2} + \sin^{-1} x + c$

B. $\sin^{-1} x - \sqrt{1-x^2} + c$

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

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

Answer: B

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17. $\int \frac{dx}{e^x-1}$ is

A. $\log|e^x|-\log|e^x-1|+c$

B. $\log|e^x|+\log|e^x-1|+c$

C. $\log|e^x-1|-\log|e^x|+c$

D. $\log|e^x+1|-\log|e^x|+c$

Answer: C

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18. $\int e^{-4x} \cos x \, dx$ is

A. $\frac{e^{-4x}}{17}$ [4 cos x - sin x] +c

B. $\frac{e^{-4x}}{17}$ [-4 cos x + sin x] +c

C. $\frac{e^{-4x}}{17}$ [4 cos x + sin x] +c

D. $\frac{e^{-4x}}{17}$ [-4 cos x - sin x] +c

Answer: B

View Text Solution

19. $\int \frac{\sec^2}{\tan^2 x - 1} dx$

A. $2\log\frac{|1-\tan x|}{|\tan x-1|}+c$

B. $\log\frac{|1+\tan x|}{|\tan x-1|}+c$

C. $\frac{1}{2}\log\frac{|\tan x+1|}{|\tan x-1|}+c$

D. $\frac{1}{2}\log\frac{|\tan x-1|}{|\tan x+1|}+c$

Answer: D

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20. $\int e^{-7x}$ sin 5x dx is

A. $\frac{e^{-7x}}{74}$[-7 sin5x -5 cos 5x]+c

B. $\frac{e^{-7x}}{74}$[7 sin5x+5 cos 5x]+c

C. $\frac{e^{-7x}}{74}$[7 sin 5x-5cos 5x]+c

D. $\frac{e^{-7x}}{74}$[-7 sin 5x-5cos 5x]+c

Answer: A

View Text Solution

21. $\int x^2 e^{\frac{x}{2}}$dx is

A. $x^2 e^{\frac{x}{2}} - xe^{\frac{x}{2}} - 8e^{\frac{x}{2}} + c$

B. $2x^2 e^{\frac{x}{2}} - 8xe^{\frac{x}{2}} - 16e^{\frac{x}{2}} + c$

C. $2x^2 e^{\frac{x}{2}} - 8xe^{\frac{x}{2}} + 16e^{\frac{x}{2}} + c$

D. $x^2 \frac{e^{\frac{x}{2}}}{2} - \frac{xe^{\frac{x}{2}}}{4} + \frac{e^{\frac{x}{2}}}{8} + c$

Answer: C

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22. $\int \frac{x-2}{\sqrt{x^2-1}}$ dx is

A. $\sqrt{x^2-1} - 2\log\left|x+\sqrt{x^2+1}\right| + c$

B. $\sin^{-1} x + 2\log\left| x+\sqrt{x^2-1} + c\right.$

C. $2\log\left|x+\sqrt{x^2-1}\right| - \sin^{-1} x + c$

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

Answer: D

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23. $\int \frac{1}{x\sqrt{(\log x)^2-5}} dx$ is

A. $\log\left|x+\sqrt{x^2-5}\right|+c$

B. $\log\left|\log x+\sqrt{\log x+5}\right|+c$

C. $\log\left|\log x+\sqrt{(\log x)^2-5}\right|+c$

D. $\log\left|\log x-\sqrt{(\log x)^2-5}\right|+c$

Answer: C

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24. $\int \sin\sqrt{x}\,dx$ is

A. $2\left(-\sqrt{x}\cos\sqrt{x}+\sin\sqrt{x}\right)+c$

B. $2\left(-\sqrt{x}\cos\sqrt{x}-\sin\sqrt{x}\right)+c$

C. $2\left(-\sqrt{x}\sin\sqrt{x}-\cos\sqrt{x}\right)+c$

D. $2\left(-\sqrt{x}\sin\sqrt{x}+\cos\sqrt{x}\right)+c$

Answer: A

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25. $\int e^{\sqrt{x}}$dx is

A. $2\sqrt{x}\left(1-e^{\sqrt{x}}\right)+c$

B. $2\sqrt{x}\left(e^{\sqrt{x}}-1\right)+c$

C. $2e^{\sqrt{x}}\left(1-\sqrt{x}\right)+c$

D. $2e^{\sqrt{x}}\left(\sqrt{x}-1\right)+c$

Answer: D

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