INDEFINITE INTEGRALS

CANSU OLCE

A STAR MATHS (www.astarmaths.com.au)

1. $\int (2x-5)^3 dx = ?$

2. $\int 3x(x^2-1)^2 dx = ?$

3. $\int 3\ dx = ?$

4. $\int 24x^5\ dx = ?$

5. $\int \frac{x^6}{3} dx = ?$

6. $\int \frac{12}{x^3}\ dx = ?$

7. $\int 5x^2 - 3x + 9\ dx = ?$

8. $\int \frac{1}{3x^2} - 8x\ dx = ?$

9. $\int x^2(3x-9)dx = ?$

10. $\int \frac{x}{2}(4-3x^2)dx = ?$

11. $\int (3+x)(4-x)dx = ?$

12. $\int (3x-1)^2\, dx = ?$

13. $\int \frac{3x^3-12x}{6x}\, dx = ?$

14. $\int \frac{2-x}{4x^3}\, dx = ?$

15. $\int \frac{2x^2-18}{x+3}\, dx = ?$

16. $\int \frac{x^2+8x+15}{x+3}\, dx = ?$

17. Given $\frac{dy}{dx} = 2x + \frac{1}{2x^2}$ and $y = 0$ when $x = \frac{1}{2}$. Express y in terms of x.

18. Given that $f''(x) = 3x^2 - 2$, $f(2) = -1$ and $f'(-1) = 4$, find f(x).

19. The gradient function of a curve is given by $\frac{dy}{dx} = \frac{1}{2x^2} + 3$. If the curve passes through the point (1, 4), find its equation.

20. Given a curve with a gradient function of $\frac{3-x^2}{4x^2}$ passes through the point $\left(\frac{1}{2}, \frac{1}{8}\right)$. Find its equation.

21. The gradient function of a curve is given by $\frac{dy}{dx} = 3x(x + k)$, where k is a constant. The gradient of the curve at point (-2, 3) is -12. Find
    a) the value of k.
    b) the equation of the curve

22. $\int (3x + 2)^6 dx = ?$

23. $\int (2x - 7)^{-2} dx = ?$

24. $\int \left(2 - \frac{x}{3}\right)^5 dx = ?$

25. $\int \frac{3}{2}(2-x)^{-4}\,dx = ?$

26. $\int \frac{1}{4(3-2x)^3} = ?$

ANSWERS

1. $\frac{1}{8}(2x-5)^4+C$
2. $\frac{1}{2}(x^2-1)^3+C$
3. $3x+C$
4. $4x^6+C$
5. $\frac{x^7}{21}+C$
6. $-\frac{6}{x^2}+C$
7. $\frac{5x^2}{3}-\frac{3x^2}{2}+9x+C$
8. $-\frac{1}{3x}-4x^2+C$
9. $\frac{3}{4}x^4-3x^3+C$
10. $x^2-\frac{3}{8}x^4+C$
11. $12x+\frac{x^2}{2}-\frac{x^3}{3}+C$
12. $3x^3-3x^2+x+C$
13. $\frac{x^3}{6}-2x+C$
14. $-\frac{1}{4x^2}+\frac{1}{4x}+C$
15. x^2-6x+C
16. $\frac{x^2}{2}+5x+C$
17. $y=x^2-\frac{1}{2x}+\frac{3}{4}$
18. $\frac{1}{4}x^4-x^2+3x-7$
19. $y=3x-\frac{1}{2x}+\frac{3}{2}$
20. $y=-\frac{3}{4x}-\frac{x}{4}+\frac{7}{4}$
21. a) $k=4$, b)$y=x^3+6x^2-13$
22. $\frac{(3x+2)^7}{21}+C$
23. $-\frac{1}{2(2x-7)}+C$
24. $-\frac{\left(2-\frac{x}{3}\right)^6}{2}+C$
25. $\frac{1}{2(2-x)^3}+C$
26. $\frac{1}{16(3-2x)^2}+C$