

### Test about the integrals of composite functions

The argument of the composite functions is a linear function

$$\int f(ax + b)dx = \frac{1}{a} \int f(ax + b)d(ax + b) = \frac{1}{a}F(ax + b) + C$$

Mark the correct answer

1  $\int e^{3x} dx$

- A**  $\frac{1}{3}e^{3x} + C$       **B**  $3e^{3x} + C$       **C**  $e^{3x} + C$       **D**  $3e^x + C$

2  $\int \sin \frac{x}{4} dx$

- A**  $4\sin \frac{x}{4} + C$       **B**  $4\cos x$       **C**  $-\frac{1}{4}\sin \frac{x}{4} + C$       **D**  $-4\cos \frac{x}{4} + C$

3  $\int (x + 10)^5 dx$

- A**  $5(x + 10)^4 + C$       **B**  $\frac{(x + 10)^6}{6} + C$       **C**  $(x + 10)^6 + C$       **D**  $\frac{1}{5}(x + 10)^5 + C$

4  $\int \frac{2dx}{x - 7}$

- A**  $(x - 7)^2 + C$       **B**  $\frac{-(x - 7)^2}{2} + C$       **C**  $2\ln|x - 7| + C$       **D**  $2(x - 7) + C$

5  $\int \frac{4dx}{\cos^2(8x + \pi)}$

- A**  $4\sin^2(8x + \pi) + C$       **B**  $\frac{32}{\sin^2(8x + \pi)} + C$       **C**  $\frac{4}{8}\tan(8x + \pi) + C$       **D**  $\frac{1}{2}\tan^2(8x + \pi) + C$

6  $\int \frac{dx}{7x + 1}$

- A**  $7\ln|x + 1| + C$       **B**  $\frac{1}{7}\ln|7x + 1| + C$       **C**  $\frac{(7x + 1)^{-2}}{-2} + C$       **D**  $\ln|7x + 1| + C$

7  $\int \frac{dx}{16x^2 + 1}$

- A**  $\frac{1}{4}\arctan 4x + C$       **B**  $\frac{1}{8}\ln \left| \frac{4x + 1}{4x - 1} \right| + C$       **C**  $\arctan \frac{4x}{16} + C$       **D**  $\frac{1}{16}\ln \left| \frac{x + 0.25}{x - 0.25} \right| + C$

8  $\int 5\cos 6x dx$

- A**  $30\cos x + C$       **B**  $\frac{5}{6}\cos 6x + C$       **C**  $5\sin 6x + C$       **D**  $-5\cos 6x + C$

9  $\int 2^{2-4x} dx$

**A**  $-4 \cdot 2^{2-4x} + C$

**B**  $-4 \cdot 2^{2-4x} \ln 2$

**C**  $(2-4x)2^{1-4x} + C$

**D**  $-\frac{2^{2-4x}}{4 \ln 2} + C$

10  $\int \frac{dx}{(12-x)^{10}}$

**A**  $\frac{-11}{(12-x)^{11}} + C$

**B**  $\frac{-1}{9(12-x)^9} + C$

**C**  $\frac{(12-x)^{-10}}{-10} + C$

**D**  $10(12-x)^9 + C$

11  $\int \frac{11dx}{\sqrt{2-9x}}$

**A**  $\frac{22\sqrt{2-9x}}{-9} + C$

**B**  $\frac{-99}{2(2-9x)^2} + C$

**C**  $11\sqrt{2-9x} + C$

**D**  $\frac{-11}{9}(2-9x)^{1/2} + C$

12  $\int \frac{dx}{1-x}$

**A**  $\ln|1-x| + C$

**B**  $\ln|x-1| + C$

**C**  $-\ln|1-x| + C$

**D**  $-\ln|x+1| + C$

**Answers**

1 – A; 2 – D; 3 – B; 4 – C; 5 – C; 6 – B; 7 – A; 8 – B; 9 – D; 10 – B; 11 – A; 12 – C