

- 1)** Find domain and the range functions $f(x) = \sqrt{\frac{x+1}{x}}$
- 2)** Find domain and the range functions $f(x) = \llbracket 2x \rrbracket$
- 3)** Find domain and the range functions $f(x) = \frac{|x|}{x}$
- 4)** Draw the graph of secant function and its inverse then find the domain and the range of them?
- 5)** If $f(x) = 3^x$, then $f(x+2) - f(x-1) = \frac{26}{3} f(x)$.
- 6)** Calculate the limit of the function $\lim_{x \rightarrow 0} \frac{1}{x^2}$
- 7)** Calculate the limit of the function $\lim_{x \rightarrow 0} \frac{x+\sqrt{x}-6}{\sqrt{x}-2}$
- 8)** Calculate the limit of the function $\lim_{x \rightarrow 2} \frac{4x}{\tan 3x + \sin 2x}$
- 9)** Evaluate $\lim_{x \rightarrow 0} \frac{\sin(ax)}{\sin(bx)}$
- 10)** Evaluate $\lim_{x \rightarrow 0} \frac{\tan^4(3x)}{x^4}$
- 11)** Evaluate $\lim_{x \rightarrow 2} \frac{-3+\sqrt{x^2+5}}{x^2-2x}$
- 12)** Calculate the derivative of the function $y = \log(9 + \sin 5x)$
- 13)** Calculate the derivative of the function $3^{\sec x^2}$
- 14)** Calculate the derivative of the function $\cot^{-1} x^2$
- 15)** Evaluate the integral $\int \frac{e^x}{e^x + 3} dx$
- 16)** Evaluate the integral $\int x^{\frac{1}{3}}(2 - x^2) dx$
- 17)** Evaluate the integral $\int \sqrt{x^7} dx$
- 18)** $\int x \cos x dx$

$$19) \int e^x \cos x \, dx$$

$$20) \int e^x \sin x \, dx$$

$$21) \int x \sin x \, dx$$

$$22) \int x \ln x \, dx$$

$$23) \int x^2 \cos x \, dx$$

$$24) \int x^2 \ln x \, dx$$

$$25) \int \sin x \cos x \, dx$$

$$26) \int \cos^2 x \, dx$$

$$27) \int (x^{2/3} - 4x^{-1/5} + 4) \, dx$$

$$28) \int \left(\frac{7}{y^{3/4}} - \sqrt[3]{y} + 4\sqrt{y} \right) dy$$

$$29) \int \frac{4x}{x^2 + 4} \, dx$$

$$30) \int e^{2 \ln x} \, dx$$

$$31) \int \frac{e^x - e^{-x}}{e^x + e^{-x}} \, dx$$

$$32) \int [\ln e^x + \ln e^{-x}] \, dx$$

$$33) \int \sec x (\tan x + \cos x) \, dx$$

$$34) \int \frac{\sin 2x}{\cos x} \, dx$$

$$35) \int \frac{\sin x}{\cos^2 x} dx$$

$$36) \int [1 + \sin^2 \theta \csc \theta] d\theta$$

$$37) \int \frac{1}{1 + \sin x} dx$$

$$38) \int \tan^2 x dx$$

$$39) \int \frac{4}{\sqrt{1-x^2}} dx$$

$$40) \text{ If } f(x) = 4e^{bx}, \text{ find the value of } b \text{ for which } f(2) = 2$$

$$41) \log_{10} x = \sqrt{2}$$

$$42) \ln\left(\frac{1}{x}\right) + \ln(2x^3) = \ln(3)$$

$$43) \log_5 5^{2x} = 8$$

$$44) \lim_{x \rightarrow -2} \frac{x^3 + 8}{x^2 - 4}$$

$$45) \lim_{x \rightarrow 3} \frac{\sqrt{x+6} - 3}{x - 3}$$

$$46) \lim_{x \rightarrow \infty} \frac{7x^2 + x - 100}{2x^2 - 5x}$$

$$47) \frac{d^2 f}{dx^2}, \text{ where } f(x) = 2x^4 - \frac{3}{\sqrt{x}}$$

$$48) f'''(t), \text{ where } f(t) = 4t^2 - 12 + \frac{4}{t^2}$$

49) Find an equation of the line tangent to the graph of $y = \frac{x^3}{x^2 - 2}$ at $x = -1$

50) Differentiate $y = \sec^{-4}(4 + x^3)$