

9. (a) Find $\int \frac{x-2}{(x^2+2)(x+1)} dx$.
- (b) Evaluate $\int_0^{\frac{5}{3}\pi} \frac{\tan x + \sin x}{\cos x} dx$.
- (c) (i) If A and B are any two points on the graph of $y = f(x)$, derive the arc length formula for the curve AB from $x = a$ to $x = b$.
- (ii) Find the length of a curve $y = \frac{3}{4}x$ from $x = 0$ to $x = 4$.
10. (a) Given the curve $x \sin y + y \cos x = 2$. Find $\frac{dy}{dx}$ when $x = \frac{\pi}{2}$ and $y = \pi$.
- (b) Use the second derivative test to investigate the stationary values of the function $f(x) = 2x^2 - 8x + 5$.
- (c) Differentiate $f(x) = \frac{1}{2} \cos 3x$ from first principles.