

1- Evaluate

a. 
$$\int_0^{\pi/2} \frac{\cos x}{\sin^2 x + 5 \sin x + 6} dx$$

Solution: (u=sin x, substitution  $\longrightarrow$  partial fraction)

b. 
$$\int \frac{x^2 + 3x - 3}{(x+1)(x^2 + 6x + 10)} dx$$

Solution: (partial fraction)

c. 
$$\int_1^{\sqrt{e}} \frac{\arcsin(\ln x)}{x} dx$$

Solution: (u=ln x, substitution  $\longrightarrow$  integration by parts)

d. 
$$\int \cos x \cos^3(\sin x) dx$$

Solution: (u=sin x, substitution  $\longrightarrow$  trigonometric integration)

e. 
$$\int \sqrt{x^2 + 2x} dx$$

Solution: (complete the square  $\longrightarrow$  trigonometric substitution)

f. 
$$= \int_0^2 \frac{dx}{|x-1|}$$

Solution: (redefine the absolute value  $\longrightarrow$  improper integral)