

1) Determine which integration technique would be used to solve the following integration problems. Do not work the problem completely.

A)  $\int \frac{dx}{x^2 - 4x + 13}$

J)  $\int \frac{x}{\sqrt{x^2 + 4x + 8}} dx$

B)  $\int \frac{x^2}{2x^3 - 1} dx$

K)  $\int \frac{2x^2 - 9x}{(x - 2)^3} dx$

C)  $\int (\cos \theta + 1)^2 d\theta$

L)  $\int_1^e \frac{\ln x}{x} dx$

D)  $\int x^3 \ln x dx$

M)  $\int \tan^4 \theta d\theta$

E)  $\int \frac{\csc^2 x}{\cot^3 x} dx$

N)  $\int \frac{e^{1/x}}{x^2} dx$

F)  $\int e^{2x} \cos 3x dx$

O)  $\int_0^{\pi/4} x \cos x dx$

G)  $\int \cos^3 \theta \sin^4 \theta d\theta$

P)  $\int \frac{x^2 - 4x + 7}{(x + 1)(x^2 - 2x + 3)} dx$

H)  $\int \frac{x^2}{\sqrt{2x - x^2}} dx$

Q)  $\int x^2 e^{2x} dx$

I)  $\int \frac{2s}{\sqrt[3]{6 - 5s^2}} ds$

## Integration by Substitution

$$2) \int \frac{2s}{\sqrt[3]{6-5s^2}} ds$$

$$3) \int \frac{x^2}{2x^3-1} dx$$

$$4) \int_1^e \frac{\ln x}{x} dx$$

$$5) \int \frac{\csc^2 x}{\cot^3 x} dx$$

$$6) \int \frac{dx}{x^2-4x+13}$$

$$7) \int \frac{e^{1/x}}{x^2} dx$$

## Trigonometric Integrals

$$8) \int \cos^3 \theta \sin^4 \theta d\theta$$

$$9) \int (\cos \theta + 1)^2 d\theta$$

$$10) \int \tan^4 \theta d\theta$$

## Integration by Parts

$$11) \int x^3 \ln x dx$$

$$12) \int_0^{\frac{\pi}{4}} x \cos x dx$$

$$13) \int e^{2x} \cos 3x dx$$

$$14) \int x^2 e^{2x} dx$$

## Integration by Trigonometric Substitution

$$15) \int \frac{x}{\sqrt{x^2+4x+8}} dx$$

$$16) \int \frac{x^2}{\sqrt{2x-x^2}} dx$$

## Integration Using Partial Fractions

$$17) \int \frac{x^2-4x+7}{(x+1)(x^2-2x+3)} dx$$

$$18) \int \frac{2x^2-9x}{(x-2)^3} dx$$

## Improper Integrals

$$19) \int_0^{\infty} x e^{-2x} dx$$

$$20) I = \int_{-2}^{14} \frac{1}{\sqrt[4]{x+2}} dx$$

$$21) \int_1^5 \frac{dx}{(x-3)^2}$$