



**TUGAS JURNAL**  
**KONSTRUKSI PERANGKAT LUNAK**  
**MODUL 10**

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**OLEH :**  
**TIURMA GRACE ANGELINA – 2311104042**  
**S1-SE07-02**

**Dosen :**  
**YIS**

**Prodi S1 Rekaya Perangkat Lunak**  
**Direktorat Kampus Purwokerto**

## 1. MEMBUAT LIBRARY MATEMATIKA

Code :

```
using System;
using MatematikaLibraries;

class Showcase
{
    static void Main()
    {
        int a = 12, b = 18;
        Console.WriteLine($"FPB dari {a} dan {b} = {Matematika.FPB(a, b)}");
        Console.WriteLine($"KPK dari {a} dan {b} = {Matematika.KPK(a, b)}");

        int[] polinomial = { -3, 6, 0, -4 }; // -3 + 6x - 4x^3
        Console.WriteLine("Turunan dari -3 + 6x - 4x^3 = " +
Matematika.Turunan(polinomial));
        Console.WriteLine("Integral dari -3 + 6x - 4x^3 = " +
Matematika.Integral(polinomial));
    }
}
```

```

using System;

namespace MatematikaLibraries
{
    public static class Matematika
    {
        public static int FPB(int a, int b)
        {
            while (b != 0)
            {
                int temp = b;
                b = a % b;
                a = temp;
            }
            return Math.Abs(a);
        }

        public static int KPK(int a, int b)
        {
            return Math.Abs(a * b) / FPB(a, b);
        }

        public static string Turunan(int[] koef)
        {
            string hasil = "";
            for (int i = 1; i < koef.Length; i++)
            {
                int k = koef[i] * i;
                string term = $"{(k >= 0 && hasil != "" ? "+" : "")}{k}x^{i - 1}";
                hasil += term;
            }
            return hasil;
        }

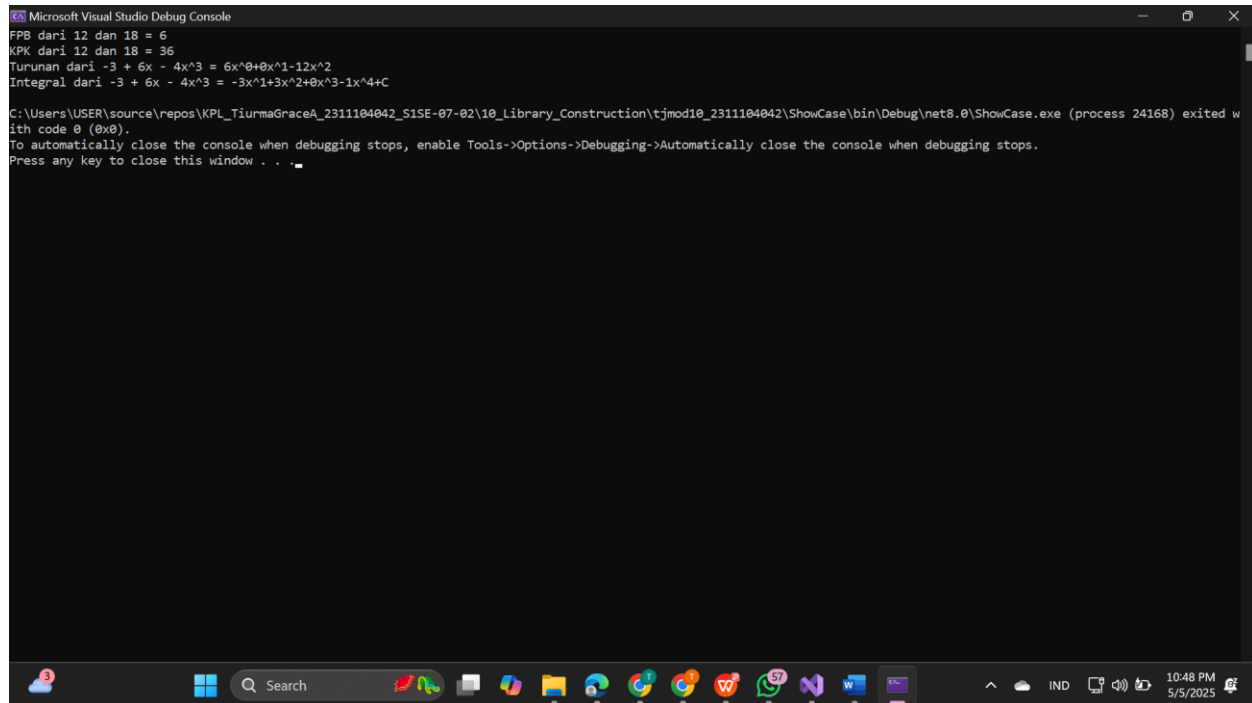
        public static string Integral(int[] koef)
        {
            string hasil = "";
            for (int i = 0; i < koef.Length; i++)
            {

```

```

        double k = (double)koef[i] / (i + 1);
        string term = $"{(k >= 0 && hasil != "" ? "+" : "")}{k}x^{i + 1}";
        hasil += term;
    }
    return hasil + "+C";
}
}
}

```



Microsoft Visual Studio Debug Console

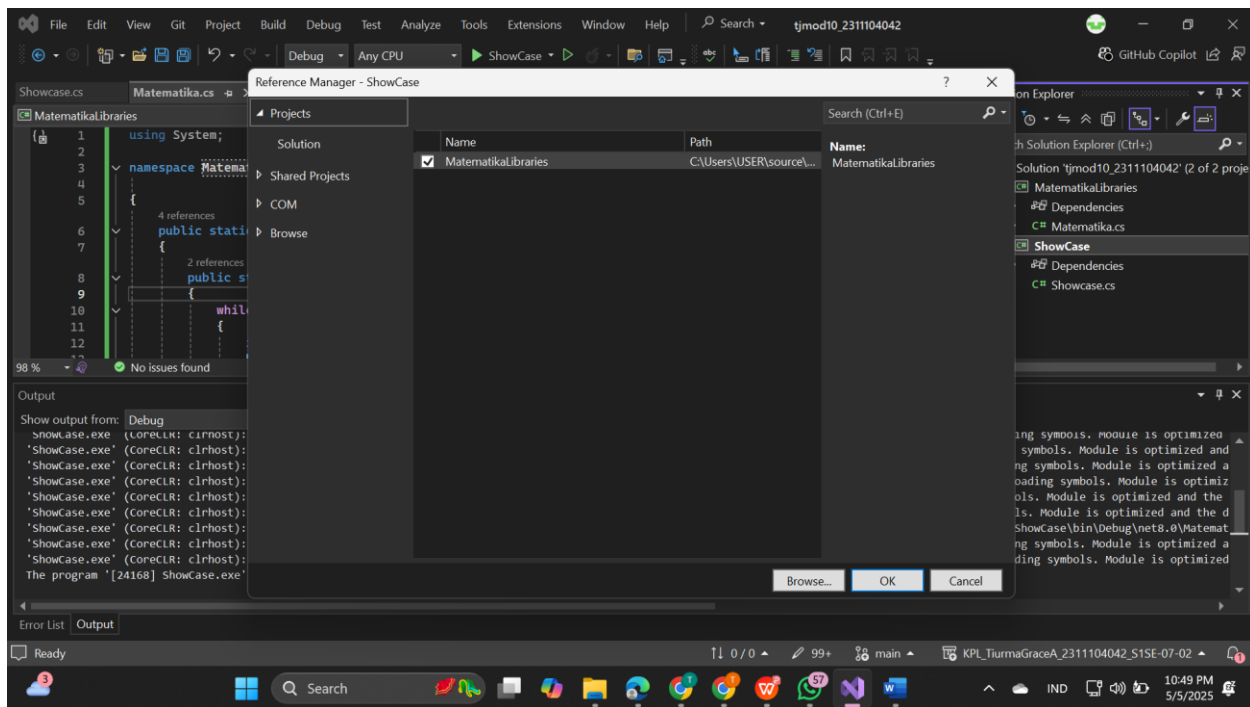
```

FPB dari 12 dan 18 = 6
KPK dari 12 dan 18 = 36
Turunan dari -3 + 6x - 4x^3 = 6x^0+0x^1-12x^2
Integral dari -3 + 6x - 4x^3 = -3x^1+3x^2+0x^3-1x^4+C

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_51SE-07-02\10_Library_Construction\tjmod10_2311104042>ShowCase\bin\Debug\net8.0>ShowCase.exe (process 24168) exited with code 0 (0x0).
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

```

Taskbar: 10:48 PM 5/5/2025



Penjelasan :

## 1. Library MatematikaLibraries

Namespace: MatematikaLibraries

Class: Matematika

Modifier: public static, agar dapat dipanggil tanpa membuat objek.

### Fungsi-Fungsi:

- **FPB(int a, int b)**  
Menghitung Faktor Persekutuan Terbesar menggunakan algoritma Euclidean.
- **KPK(int a, int b)**  
Menghitung Kelipatan Persekutuan Terkecil dengan rumus:  
 $KPK = (a \times b) / FPB(a, b)$
- **Turunan(int[] koef)**  
Mengembalikan turunan dari polinomial.  
Contoh input:  $\{-3, 6, 0, -4\} \rightarrow -3 + 6x - 4x^3$   
Maka output:  $6x^0 - 12x^2$
- **Integral(int[] koef)**  
Mengembalikan integral tak tentu dari polinomial dalam bentuk string.  
Hasil selalu ditambah dengan +C (konstanta integrasi).

## 2. Program Utama (ShowCase)

Class: Showcase

Method: Main()

Isi:

- Mendefinisikan dua bilangan  $a = 12$  dan  $b = 18$
- Memanggil FPB( $a, b$ ) dan KPK( $a, b$ )
- Mendefinisikan polinomial  $-3 + 6x - 4x^3$  dalam array
- Memanggil dan mencetak hasil Turunan dan Integral dari polinomial tersebut

COMMIT :

```
C:\WINDOWS\system32\cmd.exe
create mode 100644 10_Library_Construction\tjmod10_2311104042\MatematikaLibraries\MatematikaLibraries.csproj
create mode 100644 10_Library_Construction\tjmod10_2311104042>ShowCase>ShowCase.csproj
create mode 100644 10_Library_Construction\tjmod10_2311104042>ShowCase>ShowCase.cs

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\10_Library_Construction\tjmod10_2311104042>git reset --soft HEAD~1

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\10_Library_Construction\tjmod10_2311104042>git reset MatematikaLibraries Showcase
Unstaged changes after reset:
M      06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104042
M      09_API_Design_dan_Construction_Using_Swagger\guided\guided\obj\Debug\net8.0\guided.AssemblyInfo.cs
M      09_API_Design_dan_Construction_Using_Swagger\guided\guided\obj\Debug\net8.0\guided.AssemblyInfoInputs.cache

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\10_Library_Construction\tjmod10_2311104042>git add tjmod10_2311104042
fatal: pathspec 'tjmod10_2311104042' did not match any files

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\10_Library_Construction\tjmod10_2311104042>cd ..

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\10_Library_Construction>git add tjmod10_2311104042

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\10_Library_Construction>git commit -m "up MatematikaLibraries"
[main d6d1d83] up MatematikaLibraries
5 files changed, 118 insertions(+)
create mode 100644 10_Library_Construction\tjmod10_2311104042\MatematikaLibraries\Matematika.cs
create mode 100644 10_Library_Construction\tjmod10_2311104042\MatematikaLibraries\MatematikaLibraries.csproj
create mode 100644 10_Library_Construction\tjmod10_2311104042>ShowCase>ShowCase.csproj
create mode 100644 10_Library_Construction\tjmod10_2311104042>ShowCase>ShowCase.cs
create mode 100644 10_Library_Construction\tjmod10_2311104042\tjmod10_2311104042.sln

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\10_Library_Construction>git push origin main
Enumerating objects: 14, done.
Counting objects: 100% (14/14), done.
Delta compression using up to 12 threads
Compressing objects: 100% (11/11), done.
Writing objects: 100% (11/11), 2.14 KiB | 548.00 KiB/s, done.
Total 11 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To https://github.com/tiurmagrace/KPL_TiurmaGraceA_2311104042_S1SE-07-02.git
2b6714f..d6d1d83 main -> main

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\10_Library_Construction>
```