```
(*  47. 1. feladat.Ez egy megjegyzes.
    y'=5x^(-4)-(5*x)^(-3)+(1*x+9)^(1/9),y(0.2)=0.3.Mennyi y(1)?  *)
yy = Integrate[5 x^(-4) - (5 * x)^(-3) + (1 * x + 9)^(1 / 9), x]
```

$$-\frac{5}{3\,x^3} + \frac{1}{250\,x^2} + \frac{9}{10}\,(9+x)^{10/9}$$

```
(* yy(0.2) erteke:
     "/."    helyettesits be,  ReplaceAll   *)
yy02 = yy /. x → 0.2
```

-197.638

```
(*   a hianyzo "C" erteke:    *)
CC = 0.3 - yy02
```

197.938

```
(* y(x) *)
y = yy + CC
```

$$197.938 - \frac{5}{3\,x^3} + \frac{1}{250\,x^2} + \frac{9}{10}\,(9+x)^{10/9}$$

```
(* y(1) *)
y1 = y /. x → 1
```

207.899

```
(* kitorlunk mindenkit   *)
Remove["Global`*"]

(*  Ugyanez mint egy diff.egyenlet megoldasa:
      "=": ertekadas, legyen egyemlo,    "==" logikai egyenloseg
 NDSolve: numerikus diffegy. megoldas*)
nsol =
 NDSolve[{y'[x] == 5 x^(-4) - (5 * x)^(-3) + (1 * x + 9)^(1 / 9), y[0.2] == 0.3}, y, {x, 0.2, 1}]
y[1] /. nsol
Remove["Global`*"]
```

$\{\{y \to \text{InterpolatingFunction}[\{\{0.2, 1.\}\}, <>]\}\}$

$\{207.899\}$

```
(*   47. 2. feladat.
   y'=x*exp(5*x)-x*sin(-7*x),y(0)=2. Mennyi y(1)?   *)
yy = Integrate[x Exp[5 x] - x Sin[-7 x], x]
yy0 = yy /. x → 0
CC = 2 - yy0
y = yy + CC
y1 = y /. x → 1
N[y1]
Remove["Global`*"]
```

$$\frac{1}{175} \, \mathbb{e}^{5x} \, (-7 + 35\, x) - \frac{1}{7} \, x \, \text{Cos}[7\,x] + \frac{1}{49} \, \text{Sin}[7\,x]$$

$$-\frac{1}{25}$$

$$\frac{51}{25}$$

$$\frac{51}{25} + \frac{1}{175} \, \mathbb{e}^{5x} \, (-7 + 35\, x) - \frac{1}{7} \, x \, \text{Cos}[7\,x] + \frac{1}{49} \, \text{Sin}[7\,x]$$

$$\frac{51}{25} + \frac{4 \, \mathbb{e}^5}{25} - \frac{\text{Cos}[7]}{7} + \frac{\text{Sin}[7]}{49}$$

25.6918

```
nsol = NDSolve[{y'[x] == x Exp[5 x] - x Sin[-7 x], y[0] == 2}, y, {x, 0, 1}]
y[1] /. nsol
Remove["Global`*"]
```

{{y → InterpolatingFunction[{{0., 1.}}, <>]}}

{25.6918}

```
(*  47. 4.feladat.
   Mennyi exp(x)/(exp(x)+9) hatarozott integralja x=[9,1]-en? *)
y = Integrate[Exp[x] / (Exp[x] + 9), x]
megoldas = (y /. x → 1) - (y /. x → 9)
N[megoldas]
(*  vagy hatarozott integralassal:ff *)
Integrate[Exp[x] / (Exp[x] + 9), {x, 9, 1}]
NIntegrate[Exp[x] / (Exp[x] + 9), {x, 9, 1}]
Remove["Global`*"]
```

$\text{Log}[-9 - \mathbb{e}^x]$

$\text{Log}[9 + \mathbb{e}] - \text{Log}[9 + \mathbb{e}^9]$

-6.53996

$\text{Log}[9 + \mathbb{e}] - \text{Log}[9 + \mathbb{e}^9]$

-6.53996

```
(*  47. 7.feladat.
    Forgasd meg az f=(1x)^3,
Df=[0,3] fuggvenyt az x-tengely korul! Mennyi az igy kapott forgastest felulete?  *)
f = x^3
ff = 2 Pi f Sqrt[1 + (D[f, x])^2]
intff = Integrate[ff, x]
megoldas = (intff /. x → 3) - (intff /. x → 0)
N[megoldas]
(* vagy  *)
megoldas = Integrate[2 Pi f Sqrt[1 + (D[f, x])^2], {x, 0, 3}]
N[megoldas]
Remove["Global`*"]
```

x^3

$2 \pi x^3 \sqrt{1 + 9 x^4}$

$\dfrac{1}{27} \pi \left(1 + 9 x^4\right)^{3/2}$

$-\dfrac{\pi}{27} + \dfrac{730 \sqrt{730} \; \pi}{27}$

2294.82

$\dfrac{1}{27} \left(-1 + 730 \sqrt{730}\right) \pi$

2294.82

```
(* 47. 9.feladat.  Integrald 6*x+6*y-t D={(x,y);1≤x≤2,3≤y≤6}-on!  *)
f = 6 x + 6 y
ix = Integrate[f, x]
ihx = (ix /. x → 2) - (ix /. x → 1)
iy = Integrate[ihx, y]
ihy = (iy /. y → 6) - (iy /. y → 3)
(*  vagy  *)
Integrate[6 x + 6 y, {x, 1, 2}, {y, 3, 6}]
Remove["Global`*"]
```

$6 x + 6 y$

$3 x^2 + 6 x y$

$9 + 6 y$

$9 y + 3 y^2$

108

108

```
(* 47.11.feladat.   Mennyi exp(-4x) impropius integralja[1,+vegtelen]-en?   *)
i1R = Integrate[Exp[- 4 x], {x, 1, R}]
megoldas = Limit[i1R, {R → Infinity}]
N[megoldas]
Remove["Global`*"]
```

$$\frac{1}{4}\left(\frac{1}{e^4} - e^{-4R}\right)$$

$$\left\{\frac{1}{4\,e^4}\right\}$$

$$\{0.00457891\}$$