P1

1. PRAKTIKA: LEHEN URRATSAK "MATHEMATICA" ERABILITA

▼ **Proposatutako Ariketa P-1.1**

Egin ondoko kalkuluak:
a) cos 60° , sen 30°, tg 120°, cotg 0°, tg 45°.
b) arcsin (1/2), arctg 1, arccos 0, arctg(-1).
c) e^{100}, Log 10, I-5I, $\sqrt{8}$, $\sqrt{0.04}$.

▼ **Soluzioa P-1.1**

★ **a)**

```
Clear["Global`*"]
Cos[60 * 2 * Pi / 360]
```

$$\frac{1}{2}$$

```
Sin[30 * 2 * Pi / 360]
```

$$\frac{1}{2}$$

$$\frac{1}{2}$$

```
Tan[120 Degree]
```

$-\sqrt{3}$

$-\sqrt{3}$

```
Cot[0]
```

```
ComplexInfinity
```

```
Tan[45 Degree]
```

1

1

★ **b)**

```
ArcSin[1 / 2] * 180 / Pi
```

30

30

```
ArcTan[1] * 180 / Pi
```

45

45

```
ArcCos[0]
```

$\frac{\pi}{2}$

$\frac{\pi}{2}$

```
ArcTan[-1] * 180 / Pi
```

- 45

- 45

★ **c)**

```
E^100 // N
```

2.68812×10^{43}

2.68812×10^{43}

```
Log[10.]
```

2.30259

$\sqrt{8}$

$2\sqrt{2}$

$2\sqrt{2}$

```
Abs[-5]
```

5

$\sqrt{0.04}$

0.2

0.2

▼ **Proposatutako Ariketa P-1.2**

Definitu ondorengo funtzioak:

$$f(x)=\begin{cases} \ln(x+5) & \text{si } x > -5 \\ e^x & \text{si } x \le -5 \end{cases}$$

$$g(x) = \begin{cases} \sqrt{x} & \text{si } x > 0 \\ \text{sen}^2(x*\pi) & \text{si } x \le 0 \end{cases}$$

eta ebaluatu f(x), f(x)*g(x) eta g(f(x)) funtzioak {-5,-3,-1,1,3,5} puntuetan

▼ Soluzioa P-1.2

★ Funtzioen definizioa

```
f[x_] = If[x ≤ -5, E^x, Log[x + 5]]
```

$$\text{If}[x \le -5,\ e^x,\ \text{Log}[x + 5]]$$

```
g[x_] = If[x ≤ 0, (Sin[x * Pi])^2, √x]
```

$$\text{If}\left[x \le 0,\ \text{Sin}[x\,\pi]^2,\ \sqrt{x}\,\right]$$

★ Funtzioen ebaluazioa

```
a = {None, {"x", "f[x]", "f[x]*g[x]", "g[f[x]]"}}
```

$$\{\text{None},\ \{x,\ f[x],\ f[x]*g[x],\ g[f[x]]\}\}$$

```
b = Table[{x, f[x], f[x] * g[x], g[f[x]]}, {x, -5, 5, 2}]
```

$$\left\{\left\{-5,\ \frac{1}{e^5},\ 0,\ \frac{1}{e^{5/2}}\right\},\ \left\{-3,\ \text{Log}[2],\ 0,\ \sqrt{\text{Log}[2]}\,\right\},\right.$$

$$\left\{-1,\ \text{Log}[4],\ 0,\ \sqrt{\text{Log}[4]}\,\right\},\ \left\{1,\ \text{Log}[6],\ \text{Log}[6],\ \sqrt{\text{Log}[6]}\,\right\},$$

$$\left.\left\{3,\ \text{Log}[8],\ \sqrt{3}\,\text{Log}[8],\ \sqrt{\text{Log}[8]}\,\right\},\ \left\{5,\ \text{Log}[10],\ \sqrt{5}\,\text{Log}[10],\ \sqrt{\text{Log}[10]}\,\right\}\right\}$$

```
c = TableForm[b, TableHeadings → a]
```

x	f[x]	f[x]*g[x]	g[f[x]]
-5	$\frac{1}{e^5}$	0	$\frac{1}{e^{5/2}}$
-3	Log[2]	0	$\sqrt{\text{Log}[2]}$
-1	Log[4]	0	$\sqrt{\text{Log}[4]}$
1	Log[6]	Log[6]	$\sqrt{\text{Log}[6]}$
3	Log[8]	$\sqrt{3}$ Log[8]	$\sqrt{\text{Log}[8]}$
5	Log[10]	$\sqrt{5}$ Log[10]	$\sqrt{\text{Log}[10]}$

```
c // N
```

x	f[x]	f[x]*g[x]	g[f[x]]
-5.	0.00673795	0.	0.082085
-3.	0.693147	0.	0.832555
-1.	1.38629	0.	1.17741
1.	1.79176	1.79176	1.33857
3.	2.07944	3.6017	1.44203
5.	2.30259	5.14874	1.51743

▼ Proposatutako Ariketa P-1.3

Definitu ondorengo funtzioak:

f(x)=sin2x + cosx

$$g(x) = \begin{cases} \sin^2 x & \text{si } -2\pi \le x \le 2\pi \\ \text{tgx} + \text{sen}(x+\pi) & \text{si } x > 2\pi \end{cases}\text{, eta g(x)=3 beste kasuetan.}$$

Eta ebaluatu (f+g)(x), eta f(x)*g(x) funtzioak x=k*π, k∈{-3,-2,-1,0,1,2,3} izanik.

★ Funtzioen definizioa

```
f[x_] = Sin[2 * x] + Cos[x]
```

$$\text{Cos}[x] + \text{Sin}[2\,x]$$

```
g[x_] = Which[x < -2 * Pi, 3, x > 2 * Pi, Tan[x] + Sin[x + Pi], True, (Sin[x]) ^ 2]
```

$\text{Which}\left[x < -2\,\pi,\, 3,\, x > 2\,\pi,\, \text{Tan}[x] + \text{Sin}[x + \pi],\, \text{True},\, \text{Sin}[x]^2\right]$

★ Funtzioen ebaluazioa

```
f /@ Table[x, {x, -3, 3, 1}]
```

$\{\text{Cos}[3] - \text{Sin}[6], \text{Cos}[2] - \text{Sin}[4], \text{Cos}[1] - \text{Sin}[2],$
$\ 1, \text{Cos}[1] + \text{Sin}[2], \text{Cos}[2] + \text{Sin}[4], \text{Cos}[3] + \text{Sin}[6]\}$

```
g /@ Table[x, {x, -3, 3, 1}]
```

$\left\{\text{Sin}[3]^2, \text{Sin}[2]^2, \text{Sin}[1]^2, 0, \text{Sin}[1]^2, \text{Sin}[2]^2, \text{Sin}[3]^2\right\}$

```
a = {None, {"x", "f[x]+g[x]", "f[x]*g[x]"}}
```

$\{\text{None}, \{x, f[x]+g[x], f[x]*g[x]\}\}$

```
b = Table[{k * π, f[k * π] + g[k * π], f[k * π] * g[k * π]}, {k, -3, 3, 1}]
```

$\{\{-3\,\pi, 2, -3\}, \{-2\,\pi, 1, 0\}, \{-\pi, -1, 0\}, \{0, 1, 0\}, \{\pi, -1, 0\}, \{2\,\pi, 1, 0\}, \{3\,\pi, -1, 0\}\}$

```
c = TableForm[b, TableHeadings → a]
```

x	f[x]+g[x]	f[x]*g[x]
$-3\,\pi$	2	-3
$-2\,\pi$	1	0
$-\pi$	-1	0
0	1	0
π	-1	0
$2\,\pi$	1	0
$3\,\pi$	-1	0