
ΟΜΑΔΑ Β

■ Θέμα 1

```
f[x_Integer] := x2 - 79 x + 1601
```

```
x = 1;  
While[PrimeQ[f[x]], ++x];  
x  
Divisors[f[x]]
```

```
80
```

```
{1, 41, 1681}
```

■ Θέμα 2

```
a = {  
  {1, 2, 3, 4},  
  {2, 3, 4, 1},  
  {3, 4, 1, 2},  
  {4, 1, 2, 3}  
};
```

```
a = Table[If[i + j ≠ 4, Mod[i + j, 4], 4],  
  {i, 0, 3}, {j, 1, 4}]
```

```

$$\begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 1 \\ 3 & 4 & 1 & 2 \\ 4 & 1 & 2 & 3 \end{pmatrix}$$

```

```
a1 = Det[Part[a, {1}, {1}]]
```

```
1
```

```
a2 = Det[Part[a, {1, 2}, {1, 2}]]
```

```
-1
```

```
a3 = Det[Part[a, {1, 2, 3}, {1, 2, 3}]]
```

```
4
```

```
a4 = Det[Part[a, {1, 2, 3, 4}, {1, 2, 3, 4}]]
```

```
160
```

```
Range[2]
```

```
{1, 2}
```

```
f[a_List] :=  
  Module[{s = {}, i},  
    Do[s = AppendTo[s,  
      {Det[Part[a, Range[i], Range[i]]}],  
      {i, 1, Length[a]}];  
    s]
```

```
f[a]
```

```

$$\begin{pmatrix} 1 \\ -1 \\ 4 \\ 160 \end{pmatrix}$$

```

```
f[a][[1, 1]]
```

```
1
```

```
f[a][[2, 1]]
```

```
-1
```

```
positive[a_List] := Module[{find = True, i},  
  Do[If[f[a][[i, 1]] < 0, find = False],  
    {i, 1, Length[a]}];  
  find]
```

- *General::spell1 :*
Possible spelling error: new symbol name "positive" is similar to existing symbol "Positive". More...
- *General::spell1 :*
Possible spelling error: new symbol name "find" is similar to existing symbol "Find". More...

```
positive[a]
```

```
False
```

■ Θέμα 3

```
s = 0;  
For[i = 1, i ≤ 10, ++i, s = s + i];  
s
```

```
55
```

```
s = {};  
i = 1;  
While[i ≤ 10, s = Join[s, {i}]; ++i];  
s
```

```
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
```

■ Θέμα 4

```
g[x_ /; IntegerQ[x] && x > 0] :=  
If[Mod[x, 2] == 0,  $\frac{x}{2}$ , 3 x + 1]
```

```
g[10]
```

```
5
```

```
g[9]
```

```
28
```

```
q[x_ /; IntegerQ[x] && x > 0] :=  
  Module[{y = x, s = {x}},  
    While[g[y] ≠ 1,  
      s = AppendTo[s, g[y]]; y = g[y]];  
    s = AppendTo[s, g[y]];  
    s]
```

```
q[10]
```

```
{10, 5, 16, 8, 4, 2, 1}
```

■ Θέμα 5

```
Clear[g]
```

```
g[n_Integer] := Module[{s0 = 1, s1 = 1},  
  If[n == 0, s0,  
    If[n == 1, s1,  
      Do[s2 = 5 s1 - 6 s0;  
        s0 = s1; s1 = s2, {n - 1}]; s2]]]
```

```
g[0]
```

```
1
```

```
g[1]
```

```
1
```

```
g[2]
```

```
-1
```

```
g[3]
```

```
-11
```

```
g[4]
```

```
-49
```

```
n = 1;  
While[Mod[g[n], 7] ≠ 0, ++n];  
n  
g[n]
```

```
4
```

```
-49
```