

---

## ΟΜΑΔΑ Β

### ■ Θέμα 1

```
In[44]:= Do[
  Do[
    Do[
      If[a2 + b2 + c2 == 3 a b c, Print["(", a, ",", b, ",", c, ")"],
      {c, b, 10}],
    {b, a, 10}],
  {a, 1, 10}]
```

```
(1,1,1)
```

```
(1,1,2)
```

```
(1,2,5)
```

### ■ Θέμα 2

```
In[45]:= f[x_, y_] := Which[
  {x, y} == {1, 1}, 1,
  {x, y} == {2, 1}, -1,
  {x, y} == {1, 2}, 2,
  {x, y} == {2, 2}, -2]
```

```
In[46]:= f[1, 1]
```

```
Out[46]= 1
```

```
In[47]:= g[x_, y_] := If[x == 1 && y == 1, 1,
  If[x == 2 && y == 1, -1,
  If[x == 1 && y == 2, 2,
  If[x == 2 && y == 2, -2]]]]]
```

```
In[48]:= g[1, 2]
```

```
Out[48]= 2
```

## ■ Θέμα 3

```
In[52]:= a[n_Integer] := If[n == 1, 1,  
    a1 = 1.0; Do[a1 =  $\frac{2}{3} \left( a1 + \frac{3}{a1^2} \right)$ , {n - 1}]; a1]
```

```
In[53]:= a[1]
```

```
Out[53]= 1
```

```
In[54]:= a[2]
```

```
Out[54]= 2.66667
```

```
In[55]:= a[3]
```

```
Out[55]= 2.05903
```

```
In[56]:= Do[Print[a[i]], {i, 1, 10}]
```

```
1
```

```
2.66667
```

```
2.05903
```

```
1.84443
```

```
1.81752
```

```
1.81712
```

```
1.81712
```

```
1.81712
```

```
1.81712
```

```
1.81712
```

```
In[63]:= a[n_Integer] := If[n == 1, 1, Nest[ $\frac{2}{3} \left( \#1 + \frac{3}{\#1^2} \right)$  &, 1.0, n - 1]]
```

```
In[64]:= a[1]
```

```
Out[64]= 1
```

```
In[65]:= a[2]
```

```
Out[65]= 2.66667
```

```
In[66]:= Do[Print[a[i]], {i, 1, 10}]
```

```
1
```

```
2.66667
```

```
2.05903
```

```
1.84443
```

```
1.81752
```

```
1.81712
```

```
1.81712
```

```
1.81712
```

```
1.81712
```

```
1.81712
```

#### ■ Θέμα 4 - με μια διόρθωση στο σύμβολο της ανισότητας

```
In[16]:= a = Table[{Random[], Random[]}, {100}];
```

```
In[30]:= f[{x_, y_}] := If[x2 ≥ y, 1, 0]
```

```
In[31]:= Map[f, a]
```

```
Out[31]:= {0, 0, 1, 0, 0, 0, 0, 1, 1, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 1, 0,
          0, 1, 0, 1, 0, 0, 1, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 0, 0, 0, 1, 0, 0,
          1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0}
```

```
In[32]:= Apply[Plus, %]
```

```
Out[32]= 28
```

```
In[33]:= N[% / 100]
```

```
Out[33]= 0.28
```

```
In[34]:= Function[x, If[x[[1]]2 ≥ x[[2]], 1, 0]][{Random[], Random[]}]
```

```
Out[34]= 1
```

```
In[35]:= q[n_Integer] := N[Apply[Plus, Map[Function[x, If[x[[1]]2 ≥ x[[2]], 1, 0]],  
Table[{Random[], Random[]}, {n}]]] / n]
```

```
In[36]:= q[100]
```

```
Out[36]= 0.32
```

```
In[37]:= q[1000]
```

```
Out[37]= 0.347
```

```
In[38]:= q[10000]
```

```
Out[38]= 0.3292
```

```
In[39]:= q[100000]
```

```
Out[39]= 0.33197
```

```
In[40]:= Table[q[10i], {i, 3, 6}]
```

```
Out[40]= {0.334, 0.3301, 0.33276, 0.33302}
```

```
In[41]:= NIntegrate[x2, {x, 0, 1}]
```

```
Out[41]= 0.333333
```