3-dimensional Boolean functions

Question 1

How many 3-dimensional Boolean functions are there?

256

Because 2^8 = **256**

Count the number of symmetries of 3-dimensional Boolean functions that map 4 of the possible input patterns to 1

One symetry with a square.

One with deux points side to side and the others two to the other side.

And 4 for 3 points on the same side and the other point on a different location.

So answer is : **6**

How many linearly separable 3-dimensional Boolean functions are there?

- k = 0|8 and k = 8|0
  - 2 patterns linearly separable
- k = 1|7 and k = 7|1
  - 16 patterns linearly separable
- k = 2|6 and k = 6|2
  - 24 patterns linearly separable
- k = 3|5 and k = 5|3
  - 48 patterns linearly separable
- k = 4|4
  - 6 patterns and 8 patterns = 14 patterns linearly separable

The total is **104**