

Ex. Hypergeometrical distribution

There are 9 pencils, of which 5 are good och 4 are defect.
Take 5 pencils randomly.

What is the probability of getting three good pencils?

I make a list of all possibilities to pick 5 pencils.
This list is to the left on the following pages

To the right are the interesting outcomes; the ones with three good and two bad
(The good pencils are A,B,C,D,E and the bad are F,G,H,I)

| | |
|-----------|------------|
| A,B,C,D,E | A,B,C, F,G |
| A,B,C,D,F | A,B,C, F,H |
| A,B,C,D,G | A,B,C, F,I |
| A,B,C,D,H | A,B,C, G,H |
| A,B,C,D,I | A,B,C, G,I |
| A,B,C,E,F | A,B,C, H,I |
| A,B,C,E,G | |
| A,B,C,E,H | |
| A,B,C,E,I | A,B,D, F,G |
| A,B,C,F,G | A,B,D, F,H |
| A,B,C,F,H | A,B,D, F,I |
| A,B,C,F,I | A,B,D, G,H |
| A,B,C,G,H | A,B,D, G,I |
| A,B,C,G,I | A,B,D, H,I |
| A,B,C,H,I | |
| A,B,D,E,F | |
| A,B,D,E,G | A,B,E, F,G |
| A,B,D,E,H | A,B,E, F,H |
| A,B,D,E,I | A,B,E, F,I |
| A,B,D,F,G | A,B,E, G,H |
| A,B,D,F,H | A,B,E, G,I |
| A,B,D,F,I | A,B,E, H,I |
| A,B,D,G,H | |
| A,B,D,G,I | |
| A,B,D,H,I | A,C,D, F,G |
| A,B,E,F,G | A,C,D, F,H |
| A,B,E,F,H | A,C,D, F,I |
| A,B,E,F,I | A,C,D, G,H |
| A,B,E,G,H | A,C,D, G,I |
| A,B,E,G,I | A,C,D, H,I |
| A,B,E,H,I | |
| A,B,F,G,H | |
| A,B,F,G,I | A,C,E, F,G |
| A,B,F,H,I | A,C,E, F,H |
| A,B,G,H,I | A,C,E, F,I |
| A,C,D,E,F | A,C,E, G,H |
| A,C,D,E,G | A,C,E, G,I |
| A,C,D,E,H | A,C,E, H,I |
| A,C,D,E,I | |
| A,C,D,F,G | |

A,C,D,F,H
A,C,D,F,I
A,C,D,G,H
A,C,D,G,I
A,C,D,H,I
A,C,E,F,G
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B,D,E,H,I

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A,D,E, F,I
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A,D,E, H,I

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B,D,E, H,I

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C,E,F,G,I
C,E,F,H,I
C,E,G,H,I
C,F,G,H,I
D,E,F,G,H
D,E,F,G,I
D,E,F,H,I
D,E,G,H,I
D,F,G,H,I
E,F,G,H,I

totally 126 outcomes

60 interesting outcomes

So the probability of getting three good pencils : $\frac{60}{126} \approx 0,4762$