

Exercise 1:

Suppose we roll two six-sided dice.

What are the probabilities of getting the following scores:

- 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

Once you have the probabilities confirm that they add up to 1.

There are 36 possible combinations:

Roll 1

	1	2	3	4	5	6
Roll 2 1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Roll	Dice pairings	Probability
2	1-1	$\frac{1}{36}$
3	1-2, 2-1	$\frac{2}{36}$
4	1-3, 2-2, 3-1	$\frac{3}{36}$
5	1-4, 2-3, 3-2, 4-1	$\frac{4}{36}$
6	1-5, 2-4, 3-3, 4-2, 5-1	$\frac{5}{36}$
7	1-6, 2-5, 3-4, 4-3, 5-2, 6-1	$\frac{6}{36}$
8	2-6, 3-5, 4-4, 5-3, 6-2	$\frac{5}{36}$
9	3-6, 4-5, 5-4, 6-3	$\frac{4}{36}$
10	4-6, 5-5, 6-4	$\frac{3}{36}$
11	5-6, 6-5	$\frac{2}{36}$
12	6-6	$\frac{1}{36}$

$$\text{Total probability} = \frac{1}{36} + \frac{2}{36} + \frac{3}{36} + \frac{4}{36} + \frac{5}{36} + \frac{6}{36} + \frac{5}{36} + \frac{4}{36} + \frac{3}{36} + \frac{2}{36} + \frac{1}{36} = \frac{36}{36} = 1$$

Exercise 2

File DAV Exercise 15.xls has ten different sets of numbers, each of which represents the scores gained when rolling a six-sided die multiple times

For each column, calculate the mean and the variance

Draw two line graphs, one of mean against sample size, the other of variance against sample size

	5 rolls	10 rolls	20 rolls	40 rolls	80 rolls	160 rolls	320 rolls	640 rolls	1280 rolls	2560 rolls
Mean	2.80	2.60	3.85	3.58	3.48	3.46	3.42	3.38	3.53	3.51
Variance	6.00	1.94	3.16	3.04	3.17	2.88	2.70	2.99	2.98	2.91

