



Winning the Lottery

Each week in the UK we have a lottery that takes place twice weekly. It costs a pound to participate. Seven balls are randomly drawn from 49, six main balls, then a bonus ball. If you match all six main balls you win the jackpot. Various prizes are won for different combinations of the balls, for example, match any three balls out of the main six, and you will win ten pounds.

TASK A

- What is the probability of drawing ball number 5?
- What is the probability of drawing an even numbered ball?
- Do you have the same chance of drawing an odd numbered ball as drawing an even number ball?
- What chance do you have of drawing a ball containing a digit of 1?
- Thirteen is often classed as an unlucky number. Do you think this is true?
- If 196 balls are drawn in a row, how many 13's would you expect to get?
- Is any number more likely than another?

Below is a table showing the frequencies that the balls have appeared to date (April 2013).

Number	Freq	Number	Freq	Number	Freq	Number	Freq	Number	Freq
		10	226	20	179	30	239	40	242
1	208	11	239	21	199	31	235	41	198
2	222	12	217	22	213	32	233	42	217
3	220	13	191	23	247	33	239	43	236
4	213	14	218	24	222	34	222	44	250
5	207	15	203	25	239	35	224	45	223
6	228	16	200	26	216	36	210	46	213
7	216	17	215	27	237	37	205	47	231
8	210	18	221	28	218	38	248	48	233
9	235	19	219	29	216	39	241	49	227



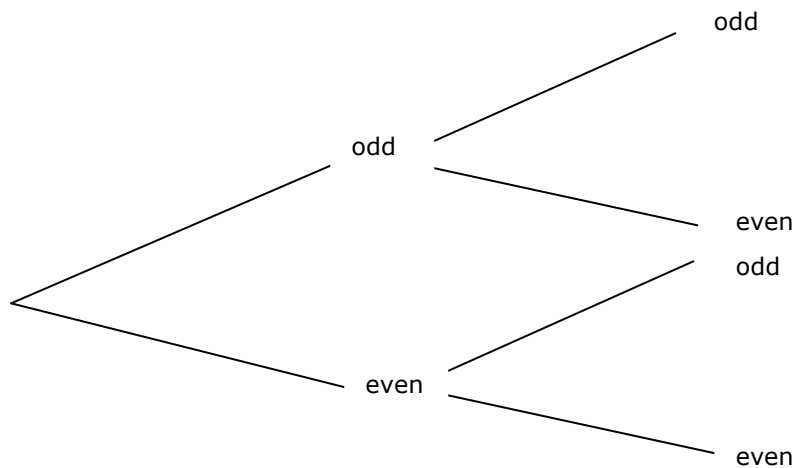
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TASK B

- a) What do you notice about the frequencies?
- b) Write a list of the five most popular and least popular numbers.
- c) Is 13 an unlucky number?
- d) Which number, from 24 and 28, is more likely to come out next?

Think about your argument and write a few sentences to convince someone of your answer.

- e) If you were going to play the lottery this week, which numbers would you pick and why?
- f) Are you more likely to draw an odd ball then an odd ball, or two even ones? Complete the following diagram to help you decide.



TASK C

Access the following site <http://lottery.co.uk/random/Default.asp> . This will allow you to simulate a lottery draw. Draw ten sets of numbers and write down these down (ie you will have a list of 60 numbers). Do the results fit the likelihood's of what you decided from the diagram? Write a general paragraph about what you have found out about the lottery.

For further investigation see <http://understandinguncertainty.org/node/563>