

### Binomial Distribution Questions - Set 1

One in 20 packets of Nutri-grain contains a \$5 note.

If you bought 12 packets, what is the probability that you would score some money? [0.460]

How many packets would you need to buy to be 90% sure of scoring? [45]

To get out of jail in monopoly you need to roll a double. How many times would you need to roll to have a 75% chance of getting out of jail? [8]

Each of the 16 parts of a car has a 2% chance of being defective. If any parts are defective, the car is defective.

How many cars would you need to buy to be 99% sure of getting a good one? [4]

### Binomial Distribution Questions - Set 2

What is the probability of getting 4 sixes when you roll 20 dice? [0.202]

If 40% of adults have a tattoo, what is the probability that there will be just 3 tattooed people in a group of 15 adults? [0.063]

What is the probability that a group of 6 adults will have at least one tattoo? [0.953]

What is the probability of getting exactly 7 heads if you toss 10 coins? [0.117]

### Revision Set 1 (Binomial)

1. A coin is bent so that  $P(H) = 0.6$ . Write the formula for the probability of getting 15 heads from 20 tosses of the coin. Then use your formula to work out the probability.
2. Use the Bpd function on your calculator to find the probability of getting just 8 heads from 18 tosses of the coin. [0.167]
3. When people walk blind-fold across Logan Road, they have a 1 in 4 chance of getting run over. How many would have to walk across to give a 95% probability that at least one is run over? [11]  
What assumptions do you need to make to get your answer? How might they affect your answer?  
[That they go across randomly rather than in groups. If they went across in groups, more would have to cross.]

### Cumulative Binomial - Bcd

1. What is the probability of getting 4 or fewer 6s when you roll 20 dice? [0.769]
2. What is the probability of getting fewer than 5 sixes when you roll 23 dice? [0.828]
3. What is the probability of getting more than 24 heads when you toss a coin 40 times? [0.077]
4. What is the probability of getting 3 or more nines when you roll two dice 12 times? [0.141]
5. What is the probability of getting between 20 and 30 heads (inclusive) if you toss a coin 50 times? [0.881]
6. 7% of people are stupid. What is the probability of finding between 3 and 8 stupid people in a group of 90? [0.78]

### Binomial Distribution - Expected Value and Standard Deviation

1. If you toss 60 fair coins, what are the expected value and standard deviation of the number of heads obtained? [30, 3.87]
2. If you roll a die 30 times, how many 4s would you expect? What would be the standard deviation? [5, 2.04]
3. 3% of Kanga scratch lotto tickets pay \$500 and the rest pay nothing. If you bought 12 tickets, what would be the expected winning. What would be the standard deviation? [\$180, \$106]