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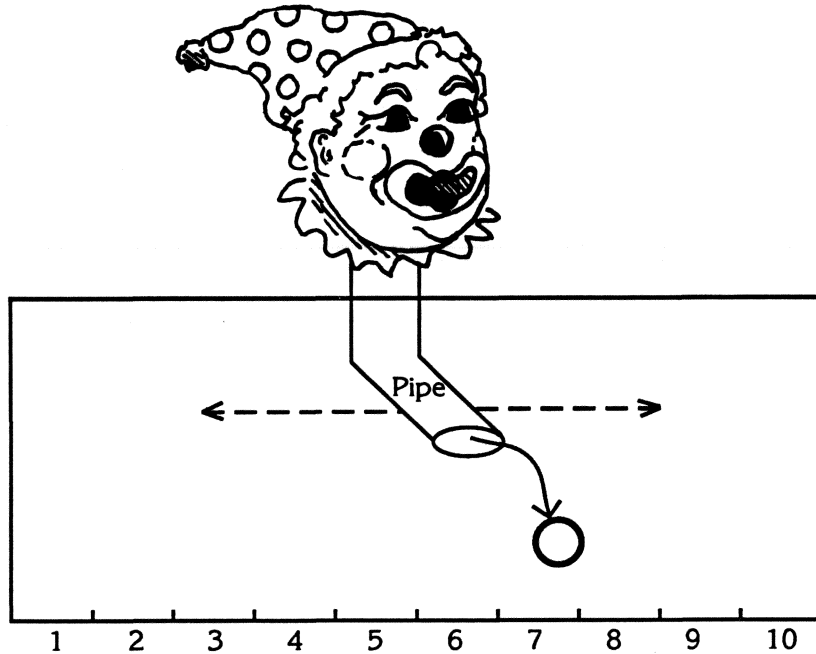
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## 24. Clowns

At the Royal Agricultural Shows (and many, rural shows and carnivals) there is a game of chance titled 'Clowns'



Five balls are purchased and placed one at a time in the clown's mouth. Each ball then rolls down a pipe which is moving from side to side and so ends up in one of the numbered compartments.

Once all the balls have been processed a total score is taken. The scores that attract prizes are

7, 9, 12, 47, 50.

- (a) What is the probability that the first ball ends up in compartment 10?
- (b) What is the probability that the second ball ends up in compartment 10?
- (c) How many different ways can a person obtain a score of 50 with the five balls?
- (d) How many ways can a person obtain a score of 7 using all five balls?
- (e) (i) What is the probability of obtaining a score of 50?  
(ii) What is the probability of obtaining a score of 7?
- (f) Determine the number of different ways of obtaining scores of 9, 47 and 12 using all five balls.
- (g) What are the associated probabilities with obtaining each score?
- (h) If there are five prizes worth \$2, \$8, \$15, \$20 and \$50, what scores should each prize be associated with?
- (i) Derive a simple rule for finding the probability of obtaining any given score.