

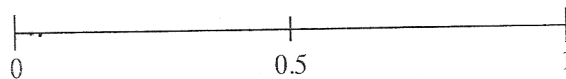
6.1 Probability Scale Exercises:

1. Describe something that is:
 - (a) *very unlikely*,
 - (b) *unlikely*,
 - (c) *likely*,
 - (d) *very likely*.

2. State whether or not each of the statements below is reasonable.
 - (a) The probability that there will be a General Election next year is 0.2.
 - (b) The probability that England will win the next football World Cup is 0.8.
 - (c) The probability that it will not rain tomorrow is 0.9.
 - (d) The probability that your school will be hit by lightning in the next week is 0.1.

3. (a) List the things described, in order, with the most likely first.
 - A You travel on a bus that breaks down on the way home from school.
 - B Your pocket money is increased during the next two weeks.
 - C You enjoy your school lunch tomorrow.
 - D You have already had a birthday this year.

(b) Mark estimates of the probabilities of each of these on a copy of the probability scale similar to the one below:



4. Explain why the probability that you will be the first person to walk on the moon is zero.

5. Describe something that has a probability of zero.

6. (a) Do you agree that the probability that you will not be abducted by aliens in the next 24 hours is 1 ?
(b) Explain why.

7. Describe something that has a probability of 1.

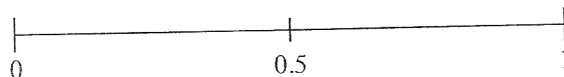
8. When you toss a fair coin, the probability of obtaining a head is $\frac{1}{2}$ and the probability of obtaining a tail is $\frac{1}{2}$.
Describe something else that has a probability that is equal to or close to $\frac{1}{2}$.

9. A packet of sweets contains mostly *red* sweets, a few *green* sweets and only one *yellow* sweet. You take a sweet at random from the packet.

The events A, B, C and D are listed below.

- A You take a *yellow* sweet.
- B You take a *green* sweet.
- C You take a *red* sweet.
- D You take a *blue* sweet.

- (a) Write these outcomes in order of probability, with the most likely first.
(b) Mark the probability of each outcome on a scale similar to the one below.

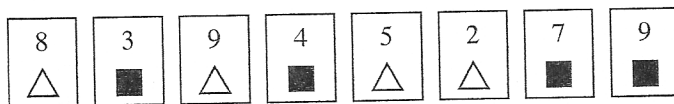


10. The probability that a train is late is 0.1. Which of the following statements is the most reasonable:

- A The train is *unlikely* to be late.
- B The train is *very unlikely* to be late.
- C The train is *likely* to be late.

Explain why you have chosen your answer.

11. (a) Joe has these cards:



Sara takes a card without looking.

Joe says: "On Sara's card, \blacksquare is more likely than \triangle ."

Explain why Joe is wrong.

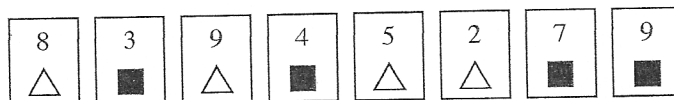
Choose one of the following words and phrases to fill in the gaps in the sentences below:

Impossible *Not Likely* *Certain* *Likely*

It is that the number on Sara's card will be *smaller than 10*.

It is that the number on Sara's card will be an *odd number*.

(b) Joe still has these cards:



He mixes them up and puts them face down on the table. Then he turns the first card over, like this:



Joe is going to turn the next card over.

Copy and complete this sentence:

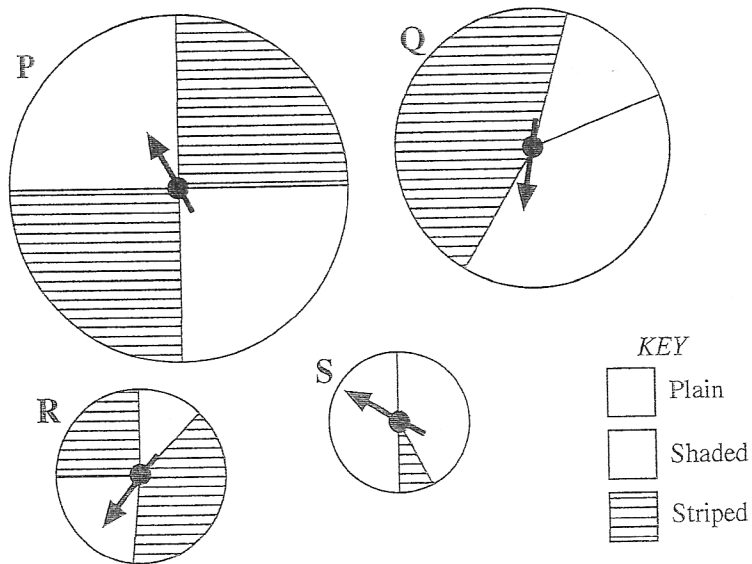
On the next card, is *less likely* than

The number on the next card could be higher than 5 or lower than 5. Which of the following possibilities is *more likely*?

Higher than 5 *Lower than 5* *Cannot tell*

Explain your answer.

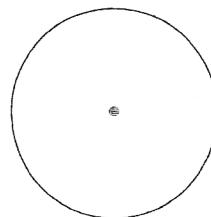
12. Here are four spinners, labelled P, Q, R and S.



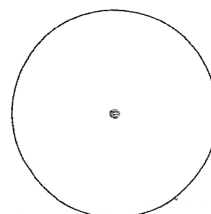
(a) Which spinner gives the *greatest* chance that the arrow will land on *plain*?

(b) Which spinner gives the *smallest* chance that the arrow will land on *shaded*?

(c) Shade a copy of the spinner shown so that it is *certain* that the arrow will land on *shaded*.

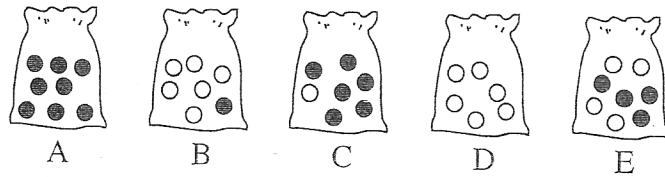


(d) Shade a copy of this spinner so that there is a 50% chance that the arrow will land on *shaded*.



13. Bryn has some bags with some black beads and some white beads. He is going to take a bead from each bag without looking.

(a) Match the pictures to the statements. The first is done for you.



- (i) It is *impossible* that Bryn will take a black bead from bag D.
- (ii) It is *unlikely* that Bryn will take a black bead from bag
- (iii) It is *equally likely* that Bryn will take a black bead or a white bead from bag
- (iv) It is *likely* that Bryn will take a black bead from bag
- (v) It is *certain* that Bryn will take a black bead from bag

(b) Bryn has 5 white beads in a bag.

He wants to make it *more likely* that he will take a *black* bead than a *white* bead out of the bag.

How many *black* beads should Bryn put into the bag?

(c) There are 20 beads altogether in another bag. All the beads are either black or white.

It is *equally likely* that Bryn will take a black bead or a white bead from the bag.

How many black beads and how many white beads are there in the bag?