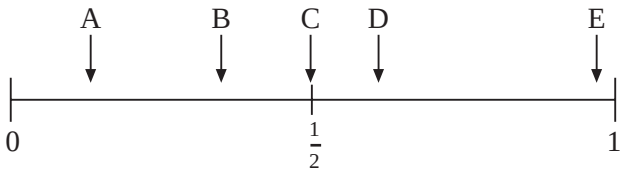
UNIT 21 *Probability of One Event* Extra Exercises 21.1

1. This probability line shows the probabilities of 5 events, A, B, C D and E:



   (a) Which event is *unlikely* to take place?

   (b) Which event is *almost certain* to take place?

   (c) Which event has an *even chance* of taking place?

   (d) Which of the events B and D is *most likely* to take place?

2. The events A, B, C, D and E are described below:

   A : it will rain tomorrow

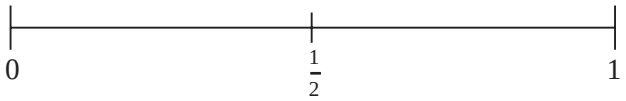
   B : it will snow tomorrow

   C : it will be very hot tomorrow

   D : the temperature will be below freezing tomorrow

   E : there will be a hailstorm tomorrow

   Mark the probability of each event on a probability line like the one below:



3. Describe an event that is:

   (a) *almost certain,*

   (b) *almost impossible,*

   (c) has an *even chance.*

UNIT 21 *Probability of One Event* Extra Exercises 21.2

1. There are 14 boys and 16 girls in a class. The headteacher selects one pupil at random. What is the probability that this pupil is:

   (a) a girl,

   (b) a boy?

2. A bag contains 8 blue sweets, 7 red sweets and 5 green sweets. A sweet is taken at random from the bag. What is the probability that it is:

   (a) blue,

   (b) red,

   (c) green,

   (d) yellow,

   (e) red *or* green,

   (f) blue *or* red?

3. A letter is selected at random from the word

   F I B O N A C C I

   What is the probability that the letter is:

   (a) A,

   (b) C,

   (c) I,

   (d) a vowel?

4. A tennis club has 100 members. Of these, 65 are adults and the rest are children. A member is selected at random. What is the probability that this member is a child?

UNIT 21 *Probability of One Event* Extra Exercises 21.3

1. Jasmin tosses a fair coin 200 times and obtains 108 heads. Calculate the relative frequency that can be used to estimate the probability of obtaining:

   (a) a head,

   (b) a tail.

2. The numbers of goals scored by a famous footballer in 30 matches are:

0	2	1	0	1	3	2	1	1	1
4	1	1	2	1	2	0	0	0	1
1	1	0	2	0	0	2	1	1	3

   From this data, estimate the probability that, in one match, he:

   (a) scores *no* goals,

   (b) scores *one or more* goals,

   (c) scores *three or more* goals.

3. Alex keeps daily records of whether or not it rains in the month of April.

   R = Rain D = Dry

R	R	R	D	R	R	R	D	D	D
D	R	D	R	R	D	D	D	D	R
R	R	R	D	D	D	D	D	D	R

   From this data, estimate the probability that it:

   (a) rains on a day in April,

   (b) does not rain on a day in April.

UNIT 21 *Probability of One Event* Extra Exercises 21.4

1. The probability that a school hockey team scores at least one goal in a match is 0.6. What is the probability that the team does *not* score any goals?

2. The probability that a train is late is 0.02. What is the probability that it is *not* late?

3. A card is taken at random from a complete pack of playing cards. The probability that it is a 7 is $\frac{1}{13}$. What is the probability the it is *not* a 7 ?

4. A packet of sweets contains 8 red sweets out of a total of 40. A sweet is taken at random from the packet.
   (a) What is the probability that the sweet is red?
   (b) What is the probability that it is *not* red?

5. The probability that a football team wins their next match is 0.3 and the probability that they lose is 0.4.
   What is the probability that they draw their next match?

6. The probability that a trick coin lands heads up is 0.85. What is the probability that it lands tails up?

UNIT 21 *Probability of One Event* Extra Exercises 21.5

1. If you tossed a fair coin 700 times, how many heads would you expect to get?

2. If you rolled a fair dice 240 times, how many times would you expect to get:
   (a) a 6,
   (b) an even number,
   (c) a prime number,
   (d) a multiple of 3 ?

3. The probability that a school bus is late is 0.04. How many times would you expect the bus to be late in a 5-week period?

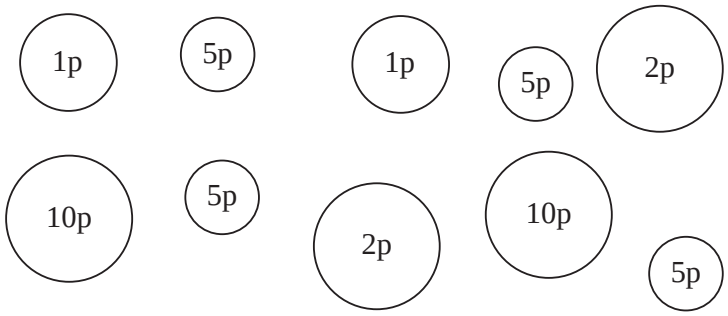
4. The probability that Ben beats his Grandad at a game of Othello is 0.2. If they play 10 games, how many can Ben expect to win?

5. Stuart's calculator has a fault and sometimes gives the wrong answer. He finds that the probability of getting a correct answer is $\frac{9}{10}$. How many wrong answers can he expect if he does 40 calculations?

UNIT 21 *Probability of One Event* Extra Exercises 21.6

1. A bag contains 8 pink balls, 3 red balls and 9 purple balls. A ball is taken at random from the bag. What is the probability that it is:
   (a) pink,
   (b) red,
   (c) purple,
   (d) pink *or* red,
   (e) pink *or* purple,
   (f) red *or* purple?

2. Emma's money box contains the coins shown below:

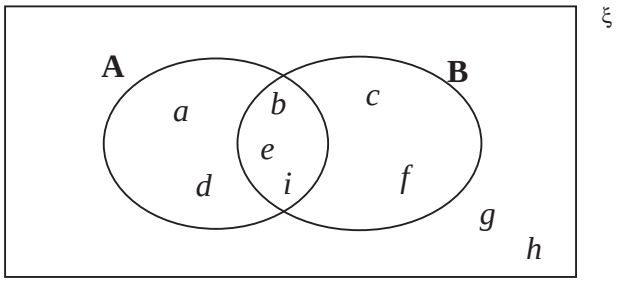


   She takes a coin out of her money box at random. What is the probability that the coin is:
   (a) a 10p *or* a 5p,
   (b) a 1p *or* a 2p,
   (c) a 1p *or* a 10p,
   (d) a 2p *or* a 5p ?

3. A packet contains 20 sweets, which includes 6 mint creams. The probability that a sweet taken at random from the packet is an eclair is $\frac{1}{4}$. What is the probability that a sweet taken at random from the bag is an eclair *or* a mint cream?

UNIT 21 *Probability of One Event* Extra Exercises 21.7

1. The letters *a, b, c, d, e, f, g, h* and *i* are sorted into sets A and B, as shown in the Venn diagram below:



One of these letters is chosen at random. Calculate the probability that this letter is a member of:

(a) A,

(b) B,

(c) A *and* B,

(d) A *or* B.

2. One of the numbers 1 to 20 is chosen at random. What is the probability that it is:

(a) an odd number,

(b) a prime number,

(c) an odd number *and* a prime number,

(d) an odd number *or* a prime number.

3. If $p(\text{A}) = \frac{1}{2}$, $p(\text{B}) = \frac{3}{4}$ and $p(\text{A or B}) = \frac{7}{8}$, determine $p(\text{A and B})$.

4. If $p(\text{A}) = \frac{1}{3}$, $p(\text{B}) = \frac{1}{4}$ and $p(\text{A and B}) = \frac{1}{6}$, determine $p(\text{A or B})$.

Extra Exercises 21.1 Answers

1. (a) A (b) E (c) C (d) D

Extra Exercises 21.2 Answers

1. (a) $\frac{8}{15}$ (b) $\frac{7}{15}$

2. (a) $\frac{2}{5}$ (b) $\frac{7}{20}$ (c) $\frac{1}{4}$

   (d) 0 (e) $\frac{3}{5}$ (f) $\frac{3}{4}$

3. (a) $\frac{1}{9}$ (b) $\frac{2}{9}$ (c) $\frac{2}{9}$ (d) $\frac{4}{9}$

4. $\frac{35}{100} = \frac{7}{20}$

Extra Exercises 21.3 Answers

1. (a) $\frac{27}{50}$ (b) $\frac{23}{50}$

2. (a) $\frac{4}{15}$ (b) $\frac{11}{15}$ (c) $\frac{1}{10}$

3. (a) $\frac{7}{15}$ (b) $\frac{8}{15}$

Extra Exercises 21.4 Answers

1. 0.4
2. 0.98
3. $\frac{12}{13}$
4. (a) $\frac{1}{5}$ (b) $\frac{4}{5}$
5. 0.3
6. 0.15

Extra Exercises 21.5 Answers

1. (a) 350
2. (a) 40 (b) 120 (c) 120 (d) 80
3. 1
4. 2
5. 4

Extra Exercises 21.6 Answers

1. (a) $\frac{2}{5}$ (b) $\frac{3}{20}$ (c) $\frac{9}{20}$
   (d) $\frac{11}{20}$ (e) $\frac{17}{20}$ (f) $\frac{3}{5}$
2. (a) $\frac{3}{5}$ (b) $\frac{2}{5}$ (c) $\frac{2}{5}$ (d) $\frac{3}{5}$
3. $\frac{11}{20}$

Extra Exercises 21.7 Answers

1. (a) $\frac{5}{9}$ (b) $\frac{5}{9}$ (c) $\frac{1}{3}$ (d) $\frac{7}{9}$
2. (a) $\frac{1}{2}$ (b) $\frac{8}{20} = \frac{2}{5}$ (c) $\frac{7}{20}$ (d) $\frac{11}{20}$
3. $\frac{3}{8}$
4. $\frac{5}{12}$